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Transportation

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49

PARTS 100 TO 177

Revised as of November 1, 1985

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Transportation

49

PARTS 100 TO 177

Revised as of November 1, 1985

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thus: 49 CFR 101.1

Explanation

The Code of Federal Regulations is a codification of the general and permanent rules published in the Federal Register by the Executive departments and agencies of the Federal Government. The Code is divided into 50 titles which represent broad areas subject to Federal regulation. Each title is divided into chapters which usually bear the name of the issuing agency. Each chapter is further subdivided into parts covering specific regulatory areas.

ISSUE DATES

Each volume of the Code is revised at least once each calendar year and issued on a quarterly basis approximately as follows:

Title 1 through Title 16	as of January 1
Title 17 through Title 27	as of April 1
Title 28 through Title 41	as of July 1
Title 42 through Title 50	as of October 1

The appropriate revision date is printed on the cover of each volume.

LEGAL STATUS

The contents of the Federal Register are required to be judicially noticed (44 U.S.C. 1507). The Code of Federal Regulations is prima facie evidence of the text of the original documents (44 U.S.C. 1510).

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To determine whether a Code volume has been amended since its revision date (in this case, November 1, 1985), consult the "List of CFR Sections Affected (LSA)," which is issued monthly, and the "Cumulative List of Parts Affected," which appears in the Reader Aids section of the daily Federal Register. These two lists will identify the Federal Register page number of the latest amendment of any given rule.

EFFECTIVE AND EXPIRATION DATES

Each volume of the Code contains amendments published in the Federal Register since the last revision of that volume of the Code. Source citations for the regulations are referred to by volume number and page number of the Federal Register and date of publication. Publication dates and effective dates are usually not the same and care must be exercised by the user in determining the actual effective date. In instances where the effective date is beyond the cut-off date for the Code a note has been inserted to reflect the future effective date. In those instances where a regulation published in the Federal Register states a date certain for expiration, an appropriate note will be inserted following the text.

OMB CONTROL NUMBERS

The Paperwork Reduction Act of 1980 (Pub. L. 96-511) requires Federal agencies to display an OMB control number with their information collection request. Many agencies have begun publishing numerous OMB control numbers as amendments to existing regulations in the CFR. These OMB numbers are placed as close as possible to the applicable recordkeeping or reporting requirements.

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Provisions that become obsolete before the revision date stated on the cover of each volume are not carried. Code users may find the text of provisions in effect on a given date in the past by using the appropriate numerical list of sections affected. For the period before January 1, 1973, consult either the List of CFR Sections Affected, 1949-1963, or 1964-1972, published in three separate volumes. For the period beginning January 1, 1973, a "List of CFR Sections Affected" is published at the end of each CFR volume.

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What is incorporation by reference? Incorporation by reference was established by statute and allows Federal agencies to meet the requirement to publish regulations in the Federal Register by referring to materials already published elsewhere. For an incorporation to be valid, the Director of the Federal Register must approve it. The legal effect of incorporation by reference is that the material is treated as if it were published in full in the Federal Register (5 U.S.C. 552(a)). This material, like any other properly issued regulation, has the force of law.

What is a proper incorporation by reference? The Director of the Federal Register will approve an incorporation by reference only when the requirements of 1 CFR Part 51 are met. Some of the elements on which approval is based are:

(a) The incorporation will substantially reduce the volume of material published in the Federal Register.

(b) The matter incorporated is in fact available to the extent necessary to afford fairness and uniformity in the administrative process.

(c) The incorporating document is drafted and submitted for publication in accordance with 1 CFR Part 51.

Properly approved incorporations by reference in this volume are listed in the Finding Aids at the end of this volume.

What if the material incorporated by reference cannot be found? If you have any problem locating or obtaining a copy of material listed in the Finding Aids of this volume as an approved incorporation by reference, please contact the agency that issued the regulation containing that incorporation. If, after contacting the agency, you find the material is not available, please notify the Director of the Federal Register, National Archives and Records Administration, Washington DC 20408, or call (202) 523-4534.

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A subject index to the Code of Federal Regulations is contained in a separate volume, revised annually as of January 1, entitled CFR INDEX AND FINDING AIDS. This volume contains the Parallel Table of Statutory Authorities and Agency Rules (Table I), and Acts Requiring Publication in the Federal Register (Table

III). A list of CFR Titles, Chapters, and Parts and an alphabetical list of agencies publishing in the CFR are also included in this volume.

An index to the text of "Title 3—The President" is carried within that volume.

The Federal Register Index is issued monthly in cumulative form. This index is based on a consolidation of the "Contents" entries in the daily Federal Register.

A List of CFR Sections Affected (LSA) is published monthly, keyed to the revision dates of the 50 CFR titles.

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John E. Byrne,
Director,
Office of the Federal Register.

November 1, 1985.

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THIS TITLE

Title 49—TRANSPORTATION is composed of eight volumes. The contents of these volumes represent all current regulations codified under this title of the CFR as of October 1, 1985, except Chapter I—Research and Special Programs Administration (Parts 100-199) which is revised as of November 1, 1985.

The parts in these volumes are arranged in the following order: Parts 1-99, Subtitle A—Office of the Secretary of Transportation; Parts 100-177 and Parts 178-199, Chapter I—Research and Special Programs Administration (DOT); Parts 200-399, Chapter II—Federal Railroad Administration (DOT), and Chapter III—Federal Highway Administration (DOT); Parts 400-999, Chapter IV—Coast Guard (DOT), Chapter V—National Highway Traffic Safety Administration (DOT), Chapter VI—Urban Mass Transportation Administration (DOT), Chapter VII—National Railroad Passenger Corporation (AMTRAK), Chapter VIII—National Transportation Safety Board, and Chapter IX—United States Railway Association; Parts 1000-1199, Parts 1200-1299, and Part 1300 to End, all Chapter X—Interstate Commerce Commission.

In the volume containing Parts 100-177, see § 172.101 for the Hazardous Materials Table. Parts 385-399 of this title contains the Federal Motor Carrier Safety Regulations, and a Subject Index to these regulations follows Chapter III. The Federal Motor Vehicle Safety Standards appear in Part 571.

For this volume, Donna L. Rickett was Chief Editor. The Code of Federal Regulations publication program is under the direction of Martha B. Girard, assisted by Robert E. Jordan.

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Title 49—Transportation

(This book contains Parts 100 to 177)

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Subtitle B—Other Regulations Relating to Transportation

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CHAPTER I—RESEARCH AND SPECIAL PROGRAMS ADMINISTRATION, DEPARTMENT OF TRANSPORTATION

(Parts 100-177)

EDITORIAL NOTE: For editorial changes and corrections to Chapter I, see 35 FR 13635, Sept. 1, 1970.

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SUBCHAPTER A—TRANSPORTATION PROGRAMS BUREAU

PART 100—[RESERVED]

PART 101—OFFICE OF TRANSPORTATION SECURITY—CARGO SECURITY ADVISORY STANDARDS

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101.3 Initiation of advisory standard setting.
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Subpart B—Petitions for Advisory Standard Setting

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101.29 Additional advisory standard setting proceedings.
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APPENDIX—CARGO SECURITY ADVISORY STANDARDS

AUTHORITY: Sec. 9(e)(1), 80 Stat. 944 (49 U.S.C. 1657(e)(1)); Pub. L. 89-670 (49 U.S.C. 1653(d), 1655, 1657(e)) (18 U.S.C. 831-835; 49 CFR 1.45 and 1.53).

SOURCE: 38 FR 6998, Mar. 15, 1973, unless otherwise noted. Redesignated by Amdts. 85-1, and 101-1, 43 FR 43306, Sept. 25, 1978.

EDITORIAL NOTE: Nomenclature changes to Part 101 appear at 43 FR 43306, Sept. 25, 1978 (Amdt. 101-1).

Subpart A—General

§ 101.1 Applicability.

(a) This part prescribes the procedures for the development and promulgation of Cargo Security Advisory Standards. These advisory standards are suggested procedures and policies intended to assist all parts of the transportation industry in reducing the incidence of loss and theft of cargo entrusted to their care. The advisory standards are not mandatory, and nothing in them replaces or modifies any statutory requirement or any regulatory authority vested in any Federal, State, or local governmental body.

(b) As used herein:

"Advisory standard" means a Cargo Security Advisory Standard issued under this part;

"Director" means the Director of Transportation Security, Research and Special Programs Administration, Department of Transportation.

"Administrator" means the administrator of the Research and Special Programs Administration.

[38 FR 6998, Mar. 15, 1973. Redesignated by Amdt. 85-1, 43 FR 43305, Sept. 25, 1978, and amended by Amdt. 101-1, 43 FR 43306, Sept. 25, 1978]

§ 101.3 Initiation of advisory standard setting.

The Director, for the Administrator, may initiate advisory standard setting on his own motion. He may also, in his discretion, consider the recommendations of other agencies of the United States, of State and local government, of any part of the transportation industry, and of any other interested person.

§ 101.5 Participation by interested persons.

Any person may participate in advisory standard setting proceedings by submitting written information or views. The Director may also allow any person to participate in additional advisory standard setting proceedings, such as informal appearances or hearings, held with respect to any advisory standard.

§ 101.7 Docket.

(a) Records of the Research and Special Programs Administration, Department of Transportation concerning advisory standard setting actions, including notices of proposed advisory standard setting, comments received in response to those notices, petitions for advisory standard setting, petitions for rehearing or reconsideration, denials of petitions for advisory standard setting, and final advisory standards are maintained in current docket form in the Office of the Chief Counsel of the Research and Special Programs Administration of the Department of Transportation.

(b) Any person may examine any docketed material at that Office and may obtain a copy of any docketed material upon payment of the prescribed fee.

Subpart B—Petitions for Advisory Standard Setting

§ 101.11 Filing of petitions.

(a) Any person may petition the Director to issue, amend, or repeal an advisory standard.

(b) Each petition filed under this section must:

(1) Be submitted in duplicate to the Docket Clerk, Chief Counsel, Research and Special Programs Administration, Department of Transportation, Washington, D.C. 20590;

(2) Set forth the text or substance of the advisory standard or amendment proposed, or sepcify the advisory standard that the petitioner seeks to have repealed, as the case may be;

(3) Explain the interest of the petitioner in the action requested; and

(4) Contain any information and arguments available to the petitioner to support the action sought.

§ 101.13 Processing of petitions.

(a) *General.* No proceeding is held directly on a petition before its disposition under this section.

(b) *Grants.* If the Director determines that the petition contains adequate justification, he initiates advisory standard setting action under Subpart C of this part.

(c) *Denials.* If the Director determines that the petition does not justify initiating advisory standard setting, he denies the petition.

(d) *Notification.* Whenever the Director determines that a petition should be granted or denied, he and the Office of the Chief Counsel prepare a notice of that grant or denial for issuance to the petitioner, and the Director issues it to the petitioner.

Subpart C—Procedures

§ 101.21 General.

(a) A notice of proposed advisory standard setting is issued and interested persons are invited to participate in the advisory standard setting proceedings with respect to each advisory standard.

(b) In his discretion, the Director may invite interested persons to participate in the advisory standard setting proceedings described in § 101.29.

§ 101.23 Contents of notices.

(a) Each notice of proposed advisory standard setting is published in the FEDERAL REGISTER.

(b) Each notice includes:

(1) A statement of the time, place, and nature of the proposed advisory standard setting proceeding;

(2) A reference to the authority under which it is issued;

(3) A description of the subjects or issues involved or the substance or terms of the proposed advisory standard;

(4) A statement of the time within which written comments must be submitted and the required number of copies; and

(5) A statement of how and to what extent interested persons may participate in the proceedings.

§ 101.25 Petitions for extension of time to comment.

(a) Any person may petition the Director for an extension of time to submit comments in response to a notice of proposed advisory standard setting. The petition must be submitted in duplicate not later than 10 days before expiration of the time stated in the notice. The filing of the petition does not automatically extend the time for petitioner's comments.

(b) The Director grants the petition only if the petitioner shows a substantive interest in the proposed advisory standard and good cause for the extension, and if the extension is in the public interest. If an extension is granted, it is granted as to all persons and is published in the FEDERAL REGISTER.

§ 101.27 Consideration of comments received.

All timely comments are considered before final action is taken on an advisory standard setting proposal. Late filed comments may be considered so far as possible without incurring additional expense or delay.

§ 101.29 Additional advisory standard setting proceedings.

The Director may initiate any further advisory standard setting proceedings that he finds necessary or desirable. The Director may also invite interested persons to present oral arguments, participate in conferences, appear at informal hearings, or participate in any other proceedings.

§ 101.31 Hearings.

(a) Sections 556 and 557 of Title 5, United States Code, do not apply to hearings held under this part. As a fact-finding proceeding, each hearing is nonadversary and there are not any formal pleadings or adverse parties. The record in a proceeding may include matters other than those presented at the hearing. An advisory standard issued will be based exclusively on the record in the proceeding.

(b) The Director designates a representative to conduct any hearing held under this part. The Chief Counsel designates a member of his staff to serve as legal officer at the hearing.

§ 101.33 Adoption of final advisory standards.

Final advisory standards are prepared by the Director and the Office of the Chief Counsel. If the Director adopts an advisory standard, it is published in the FEDERAL REGISTER.

APPENDIX—CARGO SECURITY ADVISORY STANDARDS

PART 101-1—SEAL ACCOUNTABILITY AND PROCEDURES

SUBPART A—GENERAL

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SUBPART H—U.S. GOVERNMENT AND "IN BOND" SEALS

101-1.81 General.

AUTHORITY: Sec. 9(e)(1), 89 Stat. 944 (49 U.S.C. 1657(e)(1)); 49 CFR 101.3.

SUBPART A—GENERAL

Sec. 101-1.1 *Purpose.* (a) The purpose of this Part is to set forth minimum procedures and guidelines that should be observed in order to institute and maintain an effective seal program.

(b) The provisions herein are general and each may not apply to every transportation mode.

Sec. 101-1.3 *Definitions.* As used in this part:

"Seal" means a device applied to a rail car, trailer, marine container, or air cargo container door fastening which:

(1) Indicates whether the door has been opened or the fastening tampered with, and, if so, at what point in the chain of custody the tampering occurred;

(2) Is easily applied to all types of fastenings;

(3) Readily shows when it is not properly fastened;

(4) Is of sufficient strength to resist accidental breaking;

(5) Cannot be made to appear intact when broken;

(6) Has sufficient letters to identify the carrier or shipper; and

(7) Is serially numbered to facilitate identification of the person who applied the seal.

"Transportation unit" means a container, piggyback trailer, or standard semi-trailer used by a motor carrier.

SUBPART B—DISTRIBUTION AND ACCOUNTABILITY

SEC. 101-1.11 *Purpose.* The purpose of this subpart is to suggest measures designed to assure that seals are strictly accounted for from receipt from the manufacturer to time of application. Resources devoted to a seal program are wasted unless this goal is achieved.

SEC. 101-1.13 *Ordering seals from the manufacturer.* (a)(1) To simplify security control for both the company using the seals and the manufacturer, all seals should be ordered from the manufacturer by one person or office, preferably in company headquarters, regardless of the number of terminals or other locations involved.

(2) The manufacturer can send the necessary seals directly to the individual terminals, but only at the request of the person or office identified in paragraph (a)(1) of this section.

(b) Seals should be ordered for each terminal in such a way that the terminal responsible for a particular group of seals is readily identifiable. This can be done by assigning specific blocks of numbers to each terminal, or, more easily in most cases, by using terminal prefix numbers.

SEC. 101-1.15 *Company identification.* In addition to a prefix and a serial number, the name or initials of the company using the seal or of the carrier should be stamped on each seal.

SEC. 101-1.17 *Storage.* (a) The purpose of storage is to prevent seals from being acquired by unauthorized persons for substitution or other illegal use.

(b) Seals should be stored in a locked room, cabinet or drawer, depending on the number of seals to be stored.

SEC. 101-1.19 *Records.* (a) If seals are sent from the manufacturer to a central office for further distribution to terminals, precise records, by seal serial number, should be maintained showing how many seals were sent to each location.

(b) When the terminals or other locations receive seals, either directly from the manufacturer or from company headquarters, a log should be maintained showing the lowest serial number and highest serial number of any seal received, and the date the seals were received.

SEC. 101-1.21 *Employee accountability.* (a) To maintain positive accountability, each employee authorized to apply seals should be required to sign or initial for the seals he applies, by their serial numbers.

(b) The person responsible for dispensing seals at a terminal should maintain a Seal Application Log showing, for each seal, the

(1) Date the seal is applied;

(2) Number of the transportation unit to which it is applied;

(3) Name of the person to whom the seal is issued; and

(4) Name of the person applying the seal to the transportation unit, if other than the person to whom the seal is issued.

SEC. 101-1.23 *Accountability at terminals.* The manager of the terminal where seals are applied should assign one person responsibility for the safekeeping, issuance, and record keeping of seals applied at that terminal. This is the most important step in an effective seal program.

SUBPART C—SEAL RECORDS

SEC. 101-1.31 *Purpose.* (a) Common sense and the particular circumstances of each company dictate the types of records necessary. The goal of seal records is to pinpoint where in the chain of custody a transportation unit's security was breached, in order to simplify determination of where the loss occurred, who was responsible, and other information necessary to prevent future losses. Problem areas cannot be pinpointed unless there are adequate accountability and complete records.

(b) The purpose of this subpart is to suggest measures designed to determine:

(1) Who had custody of each seal;

(2) When, where, and to which unit each seal was applied; and

(3) When, where, and by whom each seal was broken.

SEC. 101-1.33 *Seal serial numbers.* (a) Record should be maintained of the serial numbers of seals:

(1) Received at each terminal; and

(2) Issued to authorized employees for application to transportation units.

(b) In addition to being entered in seal record books, forms, and logs used by a company, seal serial numbers should also be entered on all pertinent documents (e.g., manifests, load charts or diagrams, travel orders, gate passes, bills of lading, freight bills).

Sec. 101-1.35 *Broken seals.* When necessary to break a seal en route or at an intermediate terminal, the following minimum information should be entered on the manifest (and seal log, if used):

(a) Date and time seal was broken;

(b) Name of person who broke seal;

(c) Reason seal was broken;

(d) Serial number of the seal replacing the broken seal (and the serial number of the broken seal, if a seal log is used);

(e) Name of person applying the replacement seal; and

(f) Names of witnesses.

Sec. 101-1.37 *Use of guards.* Where a gate guard is used, he should check the seal serial number against the gate pass and travel order and, ideally, enter in a gate log the serial number of:

(a) Each seal;

(b) The transportation unit to which the seal is applied; and

(c) The tractor to which a trailer is attached.

SUBPART D—SEAL APPLICATION

Sec. 101-1.41 *Time of seal application.* (a) Seals should be applied:

(1) As soon as the transportation unit has been loaded, or

(2) As soon as a loaded unsealed or improperly sealed unit is detected, or

(3) After a necessary opening en route, as soon as the reason for the opening has been accomplished. A "necessary opening en route" may be dictated by either an authorized person or an emergency situation.

(b) Application of seals should be supervised. Failure to supervise or allowing the hostler to move an unsealed transportation unit to a staging area offers opportunity to:

(1) Pilfer prior to applying the seal; or

(2) Apply a bogus seal, break the seal later, remove cargo, and then apply the legitimate seal.

Sec. 101-1.43 *Authority to apply seals.* (a) The manager of the terminal should authorize specific persons on each shift to apply seals at that terminal, and only those so authorized should be permitted to apply seals.

(b) The number of persons who should be authorized to apply seals depends on the particular circumstances at each terminal. The number should be kept to a minimum to facilitate adequate supervision to assure that operational expediency does not permit application of seals by unauthorized persons.

Sec. 101-1.45 *Application.* Locking device nuts on trailers and containers should be spot welded to prevent release of the locking handle without disturbing the seal.

Sec. 101-1.47 *Final check.* (a) The seal should be checked by the line haul or interline driver before the vehicle to which it is applied leaves the terminal.

(b) If there is a guard at the gate, he should ensure that the seal is legitimate and intact before releasing the vehicle to which it is applied.

SUBPART E—DESTINATION REMOVAL

Sec. 101-1.51 *Authority to remove seals.* (a) The terminal manager should authorize specific persons to remove seals from inbound transportation units, and, except as otherwise provided in paragraph (b) of this section, only those so authorized should be permitted to remove seals.

(b) To insure before unloading that the seal removed is the original, if a hostler has to break and remove a seal on a swing-door transportation unit before spotting it at the dock, the breaking of the seal should be witnessed from the dock by an authorized person described in paragraph (a) of this section, who should physically check the serial number on the seal against the seal serial number entered on the pertinent documents. A hostler should not be permitted to break a seal prior to spotting the transportation unit to which it is applied when the breaking cannot be observed from the dock.

Sec. 101-1.53 *Discrepancies.* (a) A seal removed from a transportation unit should be kept with the manifest and bills until the transportation unit is stripped.

(b) If there is not a discrepancy between the manifest and the cargo the seal may be discarded; if there is a discrepancy, especially in tail-loaded freight, the seal should be sent with a report on the discrepancy to the security section.

(c) A discrepancy between the serial number on the seal and the seal serial number entered on the manifest should be reported immediately to a supervisor and a notation of the details made on the manifest and other pertinent documents.

SUBPART F—ROAD PROCEDURES

Sec. 101-1.61 *Truck trailers.* (a) Each seal should be checked prior to leaving the terminal and at each stop en route to destination, including truck stops, diners, and other service areas.

(b) If a highway unit's seal has been tampered with, the driver should immediately contact home terminal, central dispatch, or the nearest company terminal for instructions.

Sec. 101-1.63 *Container and piggyback operations.* (a) In a container or piggyback operation each seal should be checked at each transfer point and the serial number on each seal recorded.

(b) As used in this section, "transfer" includes:

(1) Movement of containers on and off vessels;

(2) Movement of trailers on and off flat cars; and

(3) Trailer-on-flat-car movements from one railroad to another.

Sec. 101-1.69 *Rail cars.* Consistent with manpower and available time, but at the very least when high value/high risk shipments are involved, each seal on a rail car should be checked at each interchange point to establish the responsibility of individual railroads for losses that occur.

Subpart G—Shipper's Load and Count (SL&C)

Sec. 101-1.71 *General.* It is to the advantage of carriers in every mode to insure the security of Shipper's Load and Count Seals. This could be accomplished by use of "seal locks", offering both physical and liability protection, or, at a minimum, strong wire or cable in addition to a normal seal. This precaution increases the time and effort necessary to break into a rail car, container, or trailer, with concomitant protection to a carrier against errors in count by shipper and/or consignee.

Sec. 101-1.73 *Application.* (a) The Shipper's Load and Count Seal should be applied at the shipper's premises by the shipper's representative.

(b) The seal serial number should be recorded on all copies of the bill of lading and transcribed to the waybill.

Sec. 101-1.75 *Removal for inspection.* When a Shipper's Load and Count Seal is removed to inspect the load, the following minimum information should be entered in the bill of lading and freight bills;

(a) Date seal was removed;

(b) Name of person who broke the original seal and applied the new seal;

(c) Reason the seal was broken;

(d) Serial number of the seal which replaced the broken seal; and

(e) Location where seal was broken.

Sec. 101-1.77 *Destination procedure.* At destination, whether interline or consignee, the person receiving a trailer or rail car sealed with a Shipper's Load and Count Seal should examine the seal and record its serial number above his signature on the delivery receipt and/or interchange agreement.

Sec. 101-1.79 *Responsibility of the driver.* (a) A driver should not break a Shipper's Load and Count (SL&C) Seal under any circumstances unless he is so directed by the consignee or his representative and the person so directing witnesses the breaking of the seal.

(b) If the consignee or his representative directs a driver to break an SL&C seal:

(1) The consignee or his representative should examine the broken seal; and

(2) The consignee or his representative, or if necessary, the driver, should record the seal serial number on the delivery receipt.

Subpart H—U.S. Government and "In Bond" Seals

Sec. 101-1.81 *General.* Notwithstanding any other provision of this part, neither a U.S. Government seal nor any "in bond" seal applied under U.S. Customs supervision should be broken without adhering to the rules and regulations pertaining thereto.

[38 FR 16873, June 27, 1973. Redesignated by Amdts. 85-1, and 101-1, 43 FR 43305, Sept. 25, 1978]

PART 101-2—HIGH VALUE COMMODITY STORAGE

Subpart A—General

Sec.

101-2.1 Purpose.
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Subpart B—Location of Security Crib

101-2.11 Location.
101-2.13 Separation from over, short, and damaged crib.
101-2.15 Small facilities.

Subpart C—Construction of Security Crib

101-2.21 Materials.
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101-2.25 Visual observation.
101-2.27 Portable security crib.

Subpart D—Access and Control

101-2.31 Custodian.
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Subpart E—Accountability

101-2.41 Control log.
101-2.43 Physical inventory.
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Subpart F—Security

101-2.51 Lock.
101-2.53 Keys.
101-2.55 Surrounding area.
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101-2.59 Procedures in lieu of a security crib.
101-2.61 Protective lighting.

Authority: Sec. 9(e)(1), 80 Stat. 944 (49 U.S.C. 1657(e)(1)); 49 CFR 101.3.

Subpart A—General

Sec. 101-2.1 *Purpose.* (a) The purpose of this part is to set forth minimum procedures and guidelines that should be observed in order to minimize the risk of loss of high-value cargo.

(b) The provisions herein are general and each may not apply to every transportation mode.

Sec. 101-2.3 *Definitions.* As used in this part:

"Custodian" means a person having direct day-to-day control of a security crib, including custody of and responsibility for the contents thereof.

"High-value cargo" means cargo handled at a facility, which cargo, because of its monetary value, utility, desirability, or history of frequent theft, requires greater protection than other commodities normally handled at the facility.

"Security crib" means an enclosure for temporary storage of high-value cargo; also referred to as "cage", "corral", "vault", or "lockup".

SUBPART B—LOCATION OF SECURITY CRIB

Sec. 101-2.11 *Location.* (a) A security crib should be located in the vicinity of and, ideally, within sight of, the terminal or dock office. It should not be located in a remote area of the facility.

(b) The location should be conducive to frequent, if not continuous, surveillance by supervisory personnel.

(c) Large facilities may require two security cribs, one at each end, provided there is opportunity for reasonable surveillance of both security cribs.

Sec. 101-2.13 *Separation from over, short, and damaged crib.* A security crib should be separate from an over, short, and damaged crib. Over and damaged freight should not be stored in a security crib unless it is of high value.

Sec. 101-2.15 *Small facilities.* (a) In a small facility space limitations may prevent the use of a security crib. In such an instance high value cargo should be stored in an area specifically designated and reserved for this purpose.

(b) The area described in paragraph (a) of this section should be:

(1) Clearly marked;

(2) Made off-limits to unauthorized personnel;

(3) Within sight of the dock office; and

(4) Capable of constant supervisory observation.

SUBPART C—CONSTRUCTION OF SECURITY CRIB

Sec. 101-2.21 *Materials.* A security crib should be constructed of substantial materials which make the crib resistant to forced entry on all sides, underneath, and overhead.

Sec. 101-2.23 *Size.* (a) A security crib should be of a size adequate for storage of all high-value cargo present at the facility at any time. It should not be so large, however, as to encroach upon space necessary for normal operations, thereby resulting in the use of security crib space for other than high-value cargo.

(b) The walls of a security crib should extend to the ceiling of the room in which it is located or be at least 10 feet high with a substantial top or roof resistant to forced entry.

(c) When a shipment of high-value cargo is too large to be stored entirely within a security crib, it should be:

(1) Segregated from other cargo;

(2) Stored within sight of supervisory personnel; and

(3) Physically inspected at least daily by a supervisor for indication of theft or pilferage.

Sec. 101-2.25 *Visual observation.* Construction should permit visual observation of the entire security crib from the outside to deter unauthorized entry and covert tampering with the high-value cargo therein.

Sec. 101-2.27 *Portable security crib.* In the event that use of a portable security crib is necessary, its sides should be securely fastened to the ground to prevent entry underneath by raising of the security crib with a forklift, jack, or other lift equipment.

SUBPART D—ACCESS AND CONTROL

Sec. 101-2.31 *Custodian.* (a) When size of an operation or volume of high-value cargo requires extensive use of a security crib, a custodian should be designated as the one person directly responsible for control of the security crib. At all times access to the security crib should be under the direct control of the custodian and should be limited to those persons having legitimate business in the security crib.

(b) If the size or nature of the particular operation does not warrant the designation of a custodian, supervisory or other predesignated responsible personnel should be authorized to conduct necessary business at the security crib so long as access is properly documented.

Sec. 101-2.33 *Entrance in absence of custodian.* (a) Where the volume of business conducted at a security crib is substantial and a custodian has been designated, any additional duties assigned to the custodian should be limited to minimize the necessity to enter a security crib in his absence.

(b) If entrance to a security crib in the absence of the custodian is unavoidable, the entrance should be:

(1) Conducted in the presence of supervisory personnel;

(2) Subsequently reported to the custodian; and

(3) Entered on appropriate records.

SUBPART E—ACCOUNTABILITY

SEC. 101-2.41 *Control log.* (a) A control log should be maintained at a security crib, listing all cargo transferred into and out of the security crib.

(b) The log should contain information sufficient to identify positively:

(1) The cargo transferred;

(2) The time of the transfer; and

(3) The identity of the persons involved in the transfer

(c) Every transfer should be observed by a supervisor or other predesignated responsible person, or the custodian if one has been designated, and entered in the log.

SEC. 101-2.43 *Physical inventory.* (a) Consistent with the size of the security crib and the amount of cargo stored therein, a physical inventory of all freight in the security crib should be made periodically. Comparison should then be made with the log described in § 101-2.41 of the part or with a running inventory.

(b) The interval between inventories should not exceed 30 days. Cleared inventory records should remain on file.

SEC. 101-2.45 *Theft or pilferage.* Whenever there is evidence of theft or pilferage from the security crib an immediate and thorough investigation should be conducted. Proper records will indicate when a loss occurred and the persons involved.

SEC. 101-2.47 *Discrepancies.* A security crib should be inspected daily by the facility manager or his representative with discrepancies investigated immediately and errors in procedures brought to the attention of supervisors concerned as quickly as possible.

SEC. 101-2.49 *Completed logs.* Completed logs should be kept in a secure place for at least one year or such other period of time as the company feels they may be needed for investigation of claims.

SUBPART F—SECURITY

SEC. 101-2.51 *Lock.* (a) A security crib should be securely locked when unattended.

(b) The lock should be changed:

(1) Periodically to minimize the effect of unauthorized duplication of the key; and

(2) Immediately whenever a key to the lock is missing or otherwise unaccounted for.

(c) Serial numbers should be removed from the lock and all keys.

SEC. 101-2.53 *Keys.* (a) Keys to the lock on a security crib should be kept by authorized supervisory or other predesignated responsible personnel, or the custodian if one has been designated, and be placed in a locked key box or other secure place at the close of business.

(b) To preclude surreptitious duplication, keys should never leave the facility nor be given, even temporarily, to unauthorized persons.

(c) The number of duplicate keys should be kept to a minimum, and duplicate keys should be accorded the same protection as the original keys.

SEC. 101-2.55 *Surrounding area.* Floor space immediately adjacent to a security crib should be kept clear of stocked cargo which can reduce visibility.

SEC. 101-2.57 *Electronic surveillance.* Depending upon the value of cargo stored in a security crib, the number of transfers thereto and from, and other variables, continuous electronic surveillance of a security crib may be advisable. In such a case, a responsible person or persons should be assigned responsibility of monitoring the television receivers. The versatility of closed circuit television combined with a video tape recorder is ideal for electronic surveillance of a security crib when continuous monitoring of the television receivers is not possible. If tapes are used, they should be reviewed periodically to determine whether unauthorized entry occurs.

SEC. 101-2.59 *Procedures in lieu of a security crib.* The size of an operation, the geographic area in which a facility is located, and the prior loss record may indicate that a security crib is not needed at a particular facility. Special procedures for controlling high-value cargo should still be used and may include:

(a) Storage in a special area;

(b) Storage in the over, short, and damaged crib;

(c) Daily inventories; and

(d) Continuous surveillance.

SEC. 101-2.61 *Protective lighting.* To enhance visual surveillance of and to deter the theft of items from security cribs, adequate lighting should be provided within and without the crib. Such lighting should be sufficient to permit detection and later identification of intruders by electronic surveillance or by security guards.

[38 FR 22382, Aug. 20, 1973. Redesignated by Amdts. 85-1, and 101-1, 43 FR 43305, Sept. 25, 1978]

PART 101-3—INTERNAL ACCOUNTABILITY PROCEDURES

SUBPART A—GENERAL

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101-3.1 Purpose.
101-3.3 General.
101-3.5 Definitions.

SUBPART B—SHIPPER CARGO ACCOUNTABILITY AND PROCEDURES

101-3.11 Purpose.
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Sec.

SUBPART C—CARRIER CARGO ACCOUNTABILITY AND PROCEDURES

101-3.21 Equipment controls.
101-3.23 Outbound freight procedures: Pickup.
101-3.25 Outbound freight procedures: Stripping and loading.
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101-3.29 Inbound freight procedures: Stripping and loading.
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SUBPART D—EXCEPTIONS

101-3.41 LTL freight.
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SUBPART E—INTERCHANGE

101-3.51 General.
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SUBPART F—CONTAINERS, PALLETIZING, AND UNITIZING

101-3.61 Intermodal containers.
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101-3.71 General.

SUBPART H—"IN BOND" CARGO

101-3.81 General.

AUTHORITY: Sec. 9(e)(1), 80 Stat. 944 (49 U.S.C. 1657(e)(1)); 49 CFR 101.3.

SUBPART A—GENERAL

SECTION 101-3.1 *Purpose.* (a) The purpose of this part is to set forth minimum procedures and guidelines that should be observed in order to account for each step in the cargo movement process and to fix responsibility when exceptions occur.

(b) The provisions herein are general and each may not apply to every transportation mode.

SEC. 101-3.3 *General.* (a) All areas in which documents necessary for the proper movement or accountability of cargo are processed or handled should be treated as maximum security areas. Specifically, personnel should be restricted from:

(1) Congregating in or using for breaks, and

(2) Entering unless authorized:

these areas, and bills of lading and other documents should not be left unattended in these areas.

(b) Personnel preparing or processing the flow of documents and those having access to documents in any way should be included in the chain of accountability of those documents. Generally, such documents should be retained for at least one year; bills of lading should be retained for three years.

SEC. 101-3.5 *Definitions.* As used in this part:

"Airbill" means the shipping document used for both the air and motor portions of a freight movement.

"Bill of lading" means the document by which a carrier acknowledges receipt of freight and contracts for its carriage.

"Carrier" means a common or contract carrier, but does not mean a private carrier.

"Dock receipt" means the receipt given for a shipment received or delivered at a pier or dock covering cargo for export.

"Freight bill" means the carrier invoice for charges rendered to the consignee, the consignor, or a third party, according to the terms of the bill of lading, and showing:

(1) Consignor and origin;

(2) Consignee and destination;

(3) Route;

(4) Transportation unit number;

(5) Description of shipment;

(6) Weight, rate, and charges; and

(7) Charges prepaid, collect, or billed to a third party.

"High-value cargo" means cargo handled at a facility, which cargo, because of its monetary value, utility, desirability, or history of frequent theft, requires greater protection than other commodities normally handled at the facility.

"Manifest" means the document describing a vessel's cargo or the contents of a truck.

"Sensitive cargo" means cargo handled at a facility, which cargo, because of its strategic value, constitutes a significant national security risk requiring greater protection than other commodities normally handled at the facility.

"Shipper Load and Count" means that the contents of the transportation unit were loaded and counted by the shipper and not verified by the carrier.

"Shipping container" means any receptacle used for shipping a product.

"Transportation unit" means a trailer, intermodal container, truck, vessel, or railcar.

"Waybill" means the document prepared by a carrier at the point of origin of a shipment and forwarded with the shipment, or directly by mail, to the agent at the transfer point or waybill destination, and showing:

(1) Point of origin;

(2) Destination;

(3) Route;

(4) Consignor;

(5) Consignee;

(6) Description of shipment;

(7) Amount charged for carriage; and

(8) Charges prepaid or collect.

SUBPART B—SHIPPER CARGO ACCOUNTABILITY AND PROCEDURES

SEC. 101-3.11 *Purpose.* The purpose of this subpart is to set forth minimum procedures and guidelines to assist shippers in preparing cargo for shipment.

SEC. 101-3.13 *General.* Shippers should:

(a) Number all shipping containers in a shipment and record such numbers on the shipping documents. In addition, each container in a shipment of more than one container should be marked thusly: One of four, two of four, etc.

(b) Place clear and complete delivery and handling instructions on one end, one side, and the top of each shipping container.

(c) In marking shipping containers, use indelible inks and paints and water-resistant labels to preclude obliteration or loss of marks, shipping instructions, and handling symbols.

(d) Forward all shipping documents promptly to minimize delay at domestic and international transfer points.

(e) Count the number of pieces in each shipment and retain a record of the count and condition of the pieces and of the legible signature and employee number of the employee making the count.

(f) When practical, enclose a packing list in each container in a shipment to permit timely and complete investigation of any pilferage or damage.

(g) Consolidate small or non-uniform containers into single-load units. Unitize, palletise, and use intermodal containers whenever possible. Pilfer-proof sealing tape, corrugated fasteners, string wrapping, strapping, and banding reduce theft and pilferage.

(h) Require carrier personnel to verify their identity and restrict them to authorized areas. For each shipment, record the names of the driver and carrier, vehicle number, name of consignee, and number of pieces and total weight of the shipment.

(i) Before releasing a shipment to a carrier obtain in ink or indelible pencil the signature of the driver verifying receipt of the freight listed on the manifest.

(j) File in tamper- and theft-proof repository all copies of bills of lading, dock receipts, airbills, waybills, manifests and other documents. Generally, documents should be kept for one year; bills of lading should be kept for three years.

(k) Refrain from preprinting well-known trade names, or stenciling information about contents, on shipping cartons.

(l) If secondhand containers are used, obliterate all previous markings.

SUBPART C—CARRIER CARGO ACCOUNTABILITY AND PROCEDURES

SEC. 101-3.21 *Equipment controls.* At facilities at which cargo is handled, there should be established and maintained controls on the use on docks and platforms of all handling and moving equipment such as handcarts, forklifts, etc.

SEC. 101-3.23 *Outbound freight procedures: Pickup.* (a)(1) When a pickup call is received, a pickup order or slip for the pickup driver should be prepared.

(2) The pickup order should include the date and time of call, the names of the shipper and the consignee, the number of pieces and total weight of the shipment, and the name of the driver.

(b) When the pickup driver arrives at the shipper's facility, he should note the condition of the shipment, count the pieces therein, and compare the count with that shown on the bill of lading. He should then record the date, the number of pieces, and his truck number on the pickup order and the bill of lading and sign his name legibly in ink or indelible pencil.

(c) Upon return to the carrier's terminal, the pickup driver should report to the cashier and surrender all documents and receipts. At this time all documents and receipts should be checked for completeness and accuracy.

(d)(1) The cashier should forward the bills of lading and pickup orders to the manifest clerk who prepares the dock manifest showing the names of the driver, the shipper, and the consignee, the unit number, date, and number of pieces and total weight of the shipment. A copy of the bill of lading should be forwarded to the billing office where the invoice is prepared, the bill of lading is retained, and the line haul manifest is prepared.

(2) Control copies of all bills of lading and other documents used at the terminal should be retained.

(3) Documents for high-value cargo should be specially designated, as by a stamp such as "Supervisor sign". Such cargo itself should be handled in accordance with Part 101-2 of this Appendix, "High-Value Commodity Storage".

SEC. 101-3.25 *Outbound freight procedures: Stripping and loading.* (a) At the carrier's terminal, a separate area should be designated for each of the following types of cargo; outbound, inbound, hold-on-dock, order notify, and OS&D (over, short and damaged).

(b) Upon receiving a dock manifest, a supervisor should code the manifest as to door and unit number and assign a dockman to the particular manifest. Bay doors and equipment should be clearly and properly marked.

(c) The dockman should work from the dock manifest. He should strip the unit and, if freight is docked, note its location on the bill of lading and forward the bill to the office. Bills of lading should not be left with docked freight. If high-value commodities are docked, they should be placed in a security crib pending delivery or transfer in accordance with Part 101-2 of this Appendix, "High-Value Commodity Storage".

(d) If freight is loaded the dockman should note on the manifest, in ink or indelible pencil, the number of the outbound trailer, dock number, number of pieces and total weight of the shipment, date, origin number, and his legible signature, and return the manifest to the supervisor.

(e) Exceptions should be brought to the attention of the O. S. & D. clerk and the supervisor immediately. Drivers should be questioned about exceptions as soon as practical. Any trends should be noted, recorded, and acted upon.

(f) The supervisor should compare the manifest with the typed bills of lading, record the line haul unit number on the bills, and sort the bills by destination terminal and line haul unit. Matching bills with freight maintains the audit trail and obviates having bills for which there is no freight and freight for which there are no bills.

(g) The line haul unit should then be closed by a switcher or supervisor. Whoever is authorized to apply seals should then seal the unit and record on the seal log, in ink or indelible pencil, the seal serial number and his legible signature.

(h) The outbound manifest and typed bills by unit should be put together and seal serial numbers recorded in the office by a supervisor.

(i) The outbound manifest and bills of lading should be given to the line haul driver and the unit and seal serial numbers should be checked at the gate upon departure. Both verbally and in writing, the driver should be given instructions regarding handling of any high-value, sensitive, or hazardous cargo.

Sec. 101-3.27 *Return freight.* (a) Procedures should be established requiring that all returned high-value cargo and other selected commodities be stripped and the appropriate bills of lading returned to the office. Common sense should dictate the handling of bulk cargo.

(b) Return freight and its paperwork should be reinserted into the cargo handling process as soon as possible. The driver's legible signature, the location of the return freight on the dock, and the reason for its return should become permanent records of the carrier. A substantial part of claims paid is attributable to improper handling of return freight.

Sec. 101-3.29 *Inbound freight procedures: stripping and loading.* (a) When the line haul unit arrives at the destination terminal, the unit number and seal serial number should be checked at the gate and recorded. The driver should take the inbound manifest and bills of lading to the office where the bills should be routed to the delivery unit by door number. One control copy of the manifest and of each bill should be kept in the office.

(b) Only authorized personnel should remove a seal from an inbound trailer. If a hostler has to break and remove a seal on a swing-door trailer before spotting it at the dock, the breaking of the seal should be witnessed from the dock by an authorized person who should check the serial number on the seal against the seal serial number entered on pertinent documents, in accordance with Part 101-1 of this Appendix, "Seal Accountability and Procedures".

(c) The Inbound Supervisor should record on the line haul dispatch sheet the date, arrival time, and unit number. He should also check the number of bills against the manifest and record the date and unit number on each bill.

(d) When the dockman receives the bills he should begin to strip and load. If freight is docked, he should record on the appropriate bill, in ink or indelible pencil, the location of the freight on the dock, his legible signature, and dock number. If high-value commodities are docked, they should be placed in a security crib in accordance with the provisions of Part 101-2 of this Appendix, "High-Value Commodity Storage" If the freight is loaded, the dockman should record on each bill, in ink or indelible pencil, the unit number and his legible signature before returning the bills to the supervisor.

Sec. 101-3.31 *Inbound freight procedures: Delivery.* (a) The supervisor should match the bills of lading signed and returned by the dockman with the control copies and verify the signature of the dockman. He should then prepare the city manifest and put it into the unit "pigeon hole", pouch, or file.

(b) The assigned driver should receive the city manifest and bills from dispatch. He should note and place in the driver pouch the delivery receipt, consignee memo, driver work card, tally sheet, and detention slip.

(c) Upon leaving the terminal, the driver should be checked at the gate for seal or lock, as appropriate. Unit number, time, and date should be recorded.

(d) Upon return to terminal, the city driver should turn in to the cashier the receipts, bills, and city manifests.

SUBPART D—EXCEPTIONS

SEC. 101-3.41 *LTL freight.* LTL (Less Than Truck Load) freight should be counted and checked for visible damage at each step of the cargo handling process. This should begin at pickup where the carrier's liability attaches with the driver's signature. This should continue as the freight moves through the carrier's operation and should terminate only when the consignee accepts delivery with a clear receipt.

SEC. 101-3.43 *Dockman responsibilities.* The dockman who strips the pickup unit, the one who loads the line haul unit, the one who unloads the line haul unit, and the one who loads the delivery unit each should sign for the count and apparent physical condition of each shipment that he handles.

SEC. 101-3.45 *Driver responsibility.* Drivers should call in any exceptions immediately and a call-in log should be maintained.

SEC. 101-3.47 *Supervisor responsibility.* Exceptions should be immediately reported to a supervisor who should attempt to resolve them immediately. Exceptions which should be reported to supervisors include not only those of count and damage but also those of instances of bills of lading for which there is no freight and freight for which there are no bills.

SUBPART E—INTERCHANGE

SEC. 101-3.51 *General.* A substantial part of cargo is interchanged between carriers, often in the same mode. Cargo moving by water or air often must be handled at terminals and/or over piers, where cargo moves from railroad or truck to forwarder or stevedoring company and then to aircraft or vessel. At the terminus of the movement, the process is reversed. These transfer points are the most vulnerable places for loss of cargo. The same type of accountability procedures apply equally well to export, import, and domestic cargo.

SEC. 101-3.53 *Air cargo.* (a) Air carriers should count the number of shipping containers and their condition when receiving or delivering cargo. Cargo going from terminal to ramp via cart should be counted as it enters the belly of the aircraft. At destination, it should again be counted as it comes out of the aircraft prior to arrival at the terminal.

(b) The carrier should manifest all shipments for delivery on a trucking manifest. The manifest should show:

(1) Names of drivers and the motor carrier and truck number.

(2) Name of air carrier employee checking cargo into truck.

(3) Date and station preparing manifest.

(4) Names of shipper and consignee, air bill number, number of pieces and total weight of shipment.

(5) Any exceptions and name of agent preparing manifest.

(6) Legible signature of the truck driver, in ink or indelible pencil, verifying receipt of cargo as shown on manifest.

SEC. 101-3.55 *Marine cargo.* (a) Stevedoring companies or terminal operators should keep a tally of cargo as it is off-loaded from the vessel to the terminal and provide tally and O. S. & D. reports to the water carrier or his agent.

(b) Marine checkers should be assigned to count pieces, verify count and legibly sign appropriate documents in ink or indelible pencil. The original dock receipt should be retained as a permanent record.

(c) Cargo should not remain in terminals overly long. Delay in sorting, depalletizing, vanning, or devanning contributes to theft and pilferage.

(d) Longshoremen should be supervised and cargo checked when loaded from terminals. Marine checkers should be present to count and verify and obtain legible signatures, during loading and tie-down on truck or railcars.

SEC. 101-3.57 *Interchange: truck and rail or vessel and rail.* Interchange between truck and rail or vessel and rail generally involves movement into a terminal and then to a railcar. Accountability is generally assumed by the party responsible for the loading, counting, and sealing per tariffs duly filed with the Federal Maritime Commission or the Interstate Commerce Commission. The rail carrier checks the seal and as long as the seal remains intact assumes no liability for shortages discovered at destination. In a situation of Shipper Load and Count, if seals remain intact, the shipper assumes liability for shortage.

SUBPART F—CONTAINERS, PALLETIZING, AND UNITIZING

SEC. 101-3.61 *Intermodal containers.* (a) Intermodal containers, adaptable to carriage by truck, railcar, barge, and oceangoing vessel, reduce vulnerability to pilferage and theft and eliminate multiple handling of individual items of cargo. A shipper can use such containers to convey goods directly from his premises to his customers.

(b) Reduced handling requirements simplify accountability for shipper, carrier, and consignee. Shippers assume responsibility for accuracy of the count; so long as containers remain sealed and intact, carriers are not liable for shortages.

(c) Verification and recording of seal serial numbers in accordance with company procedures (see Part 101-1 of this Appendix, "Seal Accountability and Procedures") assures accountability in the chain of custody.

SEC. 101-3.63 *Air cargo containers.* Air cargo containers designed specifically for the configuration of aircraft offer the same advantages as intermodal containers. They provide for more efficient use of the capacity of the aircraft, reduce the number of pieces that must be counted and handled, and minimize exposure to weather, theft, pilferage, and damage, thereby simplifying accountability.

SUBPART G—CONSIGNEE CARGO ACCOUNTABILITY AND PROCEDURES

SEC. 101-3.71 *General.* Delay in taking delivery of cargo increases the possibility of theft and pilferage and makes recovery of lost shipments and pieces more difficult. Since pilferage from shipping containers can sometimes escape detection at time of delivery, consignees should:

(a) Inspect shipping containers for signs of break-in, opening, crushing, and resealing. Shipping containers should be inventoried in the presence of a carrier employee.

(b) Weigh shipping containers and compare the weights with those recorded on pertinent documents.

(c) Note on the carrier's receipt the number of pieces in each shipping container as well as their condition.

(d) Obtain, in ink or indelible pencil, the legible signature of the driver on consignee's copy of the receipt.

(e) Inspect cargo as soon after receipt as practical to determine any loss or damage, regardless of the apparent condition of the cargo at time of delivery, and report any exceptions.

(f) Obtain a copy of the carrier's delivery receipt and file it with copies of the other documents concerning the cargo.

(g) Retain as a permanent record the legible signature, in ink or indelible pencil, piece count, and condition verification of the employee accepting the cargo.

(h) Retain all essential documents for at least one year; bills of lading should be retained for three years.

SUBPART H—"IN BOND" CARGO

SEC. 101-3.81 *General.* Special care should be taken with "in bond" cargo handled under Customs supervision. United States Customs inspectors count, to the greatest extent possible, merchandise landed and quantities delivered. They also verify selected bills of lading at time of unloading. Ordinarily they do not use tally sheets, O. S. & D. (over, short, and damaged) reports, or other records of the importing carrier to determine quantity.

[39 FR 4085, Feb. 1, 1974; 39 FR 5190, Feb. 11, 1974. Redesignated by Amdt. 85-1, and 101-1, 43 FR 43305, Sept. 25, 1978]

PART 101-4—CARGO LOSS REPORTING SYSTEM AND PROCEDURES

SUBPART A—GENERAL

Sec.

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SUBPART B—ELEMENTS OF A SYSTEM

101-4.11 General.
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101-4.17 Management Review and Analysis.

SUBPART C—SYSTEM ORGANIZATION, GUIDELINES AND PROCEDURES

101-4.21 General.
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101-4.25 Guidelines.
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SUBPART A—GENERAL

Sec. 101-4.1 *Purpose.* (a) The purpose of this part is to set forth minimum procedures and guidelines athat should be observed in establishing a cargo loss reporting system.

(b) The provisions herein are general and each may not apply to every transportation mode. Adaptation may be necessary to suit mode pecularities and individual carrier needs.

Sec. 101-4.3 *General.* The movement of cargo by carrier involves an inherent risk of loss from theft and other causes due mainly to its exposure in the transportation system. Thus, the transportation carrier with this inherent characteristic should establish a cargo loss reporting system which will provide information, safeguards, and practices to protect the cargo entrusted to him by the shipping public. The need for timely, accurate and definitive cargo loss information is essential to a successful cargo claims prevention program. Early identification of the cause of cargo losses through theft, hijack, pilferage, or other reasons is an essential step to prevention and cure.

Sec. 101-4.5 *Definitions.* As used in this part:

"Bill of lading" means the document by which a carrier acknowledges receipt of freight and contracts for its carriage. Also known as "ocean bill of lading" and "air bill of lading."

"Carrier" means a common or contract carrier, but does not mean a private carrier.

"C.O.D." means collect on delivery for invoice value of the goods.

"Connecting line" means another carrier with whom the original carrier interlines a shipment for thru movement from origin to destination. Also known as "interline."

"Consignee" means the designated receiver of merchandise.

"Consignor" means the shipper of merchandise.

"Damage" means impairment of cargo shipment or contents.

"Destination terminal" means the terminal from which carrier makes final delivery. Also known as "destination port."

"Exception" means a deviation from the condition or quantity as shipped.

"Forced billing" means an internal document used by carriers to cover movement of a shipment from one terminal to another, when there is no way bill to cover, and is also used as a delivery receipt until the proper paperwork is found or prepared.

"Free astray" means a form used by carriers to cover movement of an over-shipment from one terminal to another until it can be matched up with paperwork or other disposition made.

"Hijack" means stealing a cargo vehicle by force or threat of bodily harm.

"High-value cargo" means cargo handled at a facility, which because of its monetary value, utility, desirability, or history of frequent theft, requires greater protection than other commodities normally handled at the facility.

"Intermediate terminal" means a location through which a shipment moves at some point between origin and destination. It can also be a carrier's break-bulk terminal or rehandling location. Also known as "intermediate point" and "intermediate port."

"Loss" means disappearance of cargo under circumstances where the cause cannot be defined.

"Manifest" means tabulation of waybills on the loaded vehicle. Often used by checkers as a check sheet when loading and unloading to verify the count.

"Order notify" means a shipment is consigned to order of the shipper, with instructions to notify another party of the arrival of the freight who can claim the shipment by surrendering the original "bill of lading." Also known as "sight draft."

"Origin terminal" means the terminal at which the shipment begins its travel to destination. Also known as "origin port."

"O. S. & D." means over, short, and damaged cargo.

"Overage" means a cargo shipment that is not covered by a "bill of lading" or "waybill."

"Pilferage" means theft of cargo in small amounts.

"Proof of delivery" means a request by shipper or consignee for proof of delivery, requesting name, date and exceptions.

"Seal procedure" means an internal procedure detailing company practices in seal application and removal.

"Security" means human or mechanical protection for cargo shipments.

"Shortage" means a shipment that is incomplete as compared with its description on the "bill of lading" or "waybill."

"S.L. & C." means shipper's load and count.

"Theft" means larcency or unlawfully taking goods of another without force.

"Tracer" means an internal inquiry between terminals to determine location or status of a shipment.

"Traffic" means goods moved by a transportation carrier. Also known as "cargo" or "freight."

"Waybill" means a document prepared from a "bill of lading" that accompanies shipment from origin to destination. Also known as "freight bill."

SUBPART B—ELEMENTS OF A SYSTEM

Sec. 101-4.11 *General.* An effective cargo loss reporting system must contain certain elements for successful implementation by employees and management. This subpart sets forth the minimal elements of such a system.

Sec. 101-4.13 *Procedures.* Detailed procedures for identifying and handling over, short, and damage cargo should be prepared by each carrier's management office and placed in terminals for reference, guidance, and training of all personnel involved in the cargo movement.

Sec. 101-4.15 *Training.* (a) Employees should have knowledge of the operating authority and traffic patterns of the carrier. This includes terminal locations, points served, service restrictions and exceptions, and average service schedule to all points.

(b) Drivers, dock workers and others involved with the traffic should have knowledge of customer freight movements, commodities shipped and pecularities of specific customers.

(c) Employees should have full knowledge of the loss reporting system and the company's claim prevention program.

(d) All supervisory and management personnel should be involved in the training and fully understand the loss reporting system, how it functions, its objectives, the mechanics thereof, and who to contact in making the system work.

Sec. 101-4.17 *Management Review and Analysis.* (a) Reports in appropriate detail from the Cargo Loss Reporting System should be reviewed by the following: (1) General management, (2) security officers, (3) claims managers, (4) directors of operations, and (5) terminal managers.

(b) The cargo loss data should form the basis for reports on cargo claims which are or may be required by a regulatory agency.

(c) Reports should be analysed to pinpoint needed improvements in the claims prevention program.

SUBPART C—SYSTEM ORGANIZATION, GUIDELINES AND PROCEDURES

Sec. 101-4.21 *General.* (a) The cargo loss reporting system is intended to be responsive to management in the claims prevention program.

(b) The system should provide the most effective means and times to report all discrepancies in shipments to minimize claims exposure, and to provide better service to the customer.

(c) The reports generated by the system will serve as information to the claims department for denial or approval of claims presented by customers.

Sec. 101-4.23 *Organization.* (a) A central office to serve as the clearinghouse for all reports of shipment discrepancies should be established preferably at the corporate or company headquarters.

(b) This central office should be the focal point for all reports of overages, shortages, and damages and is responsible for: (1) Clearing reports on discrepancies; (2) matching overages and shortages; (3) issuing disposition instructions to terminals; and (4) developing advisory instructions for terminals with special problems.

(c) The central office should be in the claims department with direct communication with all terminals by means of teletype or telephone.

Sec. 101-4.25 *Guidelines.* (a) The loss reporting procedures should be implemented immediately upon discovery of an overage, shortage, or damage in shipment.

(b) The reports of an overage, shortage, or damage should included information defining who, what, when, where and how.

(c) Effectiveness of the procedures depends on detailed facts and prompt action.

(d) When a shortage is discovered at a terminal, usually one of the following errors has occurred:

(1) A billing error was made.

(2) Driver failed to pick up the entire shipment.

(3) A theft occurred from the pickup unit enroute to the terminal.

(4) The freight was loaded on the wrong unit at the shipper's dock.

(5) Another carrier picked up the freight in error.

(e) Action to be taken when such shortages are discovered:

(1) Check for billing or typographical error on bill of lading.

(2) Review with checker and crew that unloaded pickup unit.

(3) Check dock area for the missing freight.

(4) Interview the pickup driver promptly, by telephone if necessary, for his recollection of facts surrounding pickup and his count.

(5) Contact the shipper for possible error in his billing and have him recheck his dock for the missing freight. Obtain names of other carriers who made pick ups that day at his dock.

(6) Call other carriers and ask them to check for the missing freight.

(7) Check with the consignee to determine if he received the freight via another carrier.

(8) Advise the central clearing office and other terminals of the shortage with a full description.

(f) Other actions that should be taken:

(1) If shortage was part of a shipment, move the balance to destination with accompanying shortage report. Do not hold up the freight.

(2) If shortage is a complete shipment, a report should be prepared immediately for the central clearing office.

(3) If theft is indicated, notify all appropriate law enforcement authorities.

(4) Made a daily check for the missing freight with other terminals for the next five workdays.

(5) If the missing freight is located as a complete shipment, ship it promptly to destination on original waybill, free-astray bill or forced billing, depending on curcumstances.

(6) If the recovered freight is a part shipment, and the balance of the shipment has already moved to destination, prepare a free-astray bill and move the freight to destination promptly for final delivery.

(7) If the shortage is from an interline carrier, a signed and dated exception should be noted by the checker on connecting carriers freight bill.

(8) If the shortage is noted at an intermediate terminal, it should be recorded by the checker who should notify his supervisor. The central clearing office should be notified as well as the original and destination terminal.

(g) Copies of all over, short, and damage reports should be sent to the central clearing office where records and statistics should be compiled from each day's receipts, detailing all pertinent facts regarding each incident. Such facts should serve to furnish the carrier's management with facts and figures to formulate an improved claim prevention program.

(h) The central clearing office should maintain a daily follow-up with terminals on outstanding shortages and other omissions, thereby encouraging the terminals to intensify the search for facts to close out those files.

(i) When discrepancies are found and reported, immediate action should commence to correct the cause or causes.

(j) A daily schedule should be established for reporting all shortages and overages. Each carrier, based on experience, length of haul, and other factors should establish a timeframe within which discrepancies are reported to the central office and to other terminals to clear them and for a match-up. The report on losses should contain the following information:

(1) Name of Shipper;
(2) Name of Consignee;
(3) Waybill number;
(4) Date of shipment;
(5) Commodity;
(6) Weight;
(7) Type of shipment (container, truckload, pallet, etc.);
(8) Part missing (in shortage shipment);
(9) Part damaged;
(10) C.O.D. or order notify;
(11) Prepaid/collect;
(12) Where checked and by whom;
(13) How many times handled;
(14) Type loss (theft/hijack/pilferage/unknown) and
(15) Location where loss was detected.

(k) Any failure of the system in reporting losses should be investigated to determine and institute corrective measures.

(l) Prompt investigation of distressed freight and immediate reporting to the central control is essential to curtail cargo loss claims. This enhances the opportunity for correction and recovery before the audit trail becomes obliterated.

(m) Liaison should be established with all law enforcement agencies for help as needed. All theft losses and break-ins or attempted break-ins of facilities should be reported to these agencies.

(n) Shipments found without identification should be segregated and placed in the security cage while a search is made by an authorized person for packing slips or invoices to determine ownership. If identification is made, the freight should be recoopered and proper marking should be applied to each shipping container for prompt movement to destination.

(o) Overages found in the carrier's terminals should be reported in the same manner as shortages, for an overage can well mean a shortage elsewhere.

(p) All damaged freight should be reported to the central office. Local terminals should recooper such freight promptly to prevent further damage. Dry freight containers (cartons, bags, etc.) should be securely recoopered with sealing tape, banding wire, or other material to prevent further loss of contents or further damage. Waybills should be marked to indicate that shipment has been damaged.

(q) Each carrier should have printed forms for all reports in a format best suited to its needs for recording all types of discrepancies. The data content of the form should be tailored to its loss reporting system so that information can be retrieved.

(r) The carrier should issue advisory bulletins as needed to all terminals on specific problems or situations that arise. Changes in the existing Loss Reporting System should be made as necessary.

Sec. 101-4.27 *Procedure.* (a) A comprehensive over, short, and damage manual should be prepared and maintained based on the guidelines in section 85-4.25 of this subpart.

(b) An employee at each terminal should be designated the O. S. & D. clerk. Such person should be experienced in freight, movement, company routes, customer identify, commodities shipped, all movements of specialized cargoes, and high-risk movements. The O. S. & D. clerk should also possess a knowledge of claims handling, cargo claims prevention procedures, cargo security, packaging required by tariffs, recoopering practices, customer service, tracing, and related activities. He should be able to detect and correct flaws in handling and checking procedures, security measures and identification of problems relating to cargo claims prevention.

(c) The O. S. & D. clerk, who may be the terminal's Claims Prevention Manager, should be knowledgeable enough to judge when security has been breached and advise management, who in turn should call in law enforcement personnel.

(d) A daily inventory should be taken of freight docks to detect over and damaged freight. Such discoveries should be taken to recoop any damaged shipments, segregating those that are likely to damage other cargo, and to provide security for high-value cargo. The O. S. & D. Clerk and the Tracer Clerk should maintain close coordination to expedite delivery of overages.

(e) A centralized reporting procedure for O. S. & D.'s should be established for the central office to receive reports of all discrepancies from all locations, both verbal and written. This will enable that office, along with terminal help, to match up shortages, clear other discrepancies, and provide for disposition of O. S. & D. freight.

(f) The central office should have final authority in advising terminals on disposition of shipments involved in discrepancies and possible claims. This insures that all overages are promptly forwarded to proper destination with bills to cover until they can be matched up with proper billing at destination. Shortages should be given preferred attention, since they represent the single greatest dollar loss to a carrier.

(g) The central office should establish daily reports to account statistically for O. S. & D. activity and provide management with information to reflect error experience each day. High O. S. & D. activity is a sign of operational problems and a forerunner to severity in cargo loss claims.

(h) Daily written records of all events relating to O. S. & D.'s must be maintained and be part of the carrier's files and available for inspection by the claims department as needed.

(i) The central office should maintain a cross-reference file of O. S. & D.'s that is continually updated for accurate reference. It should be posted and purged daily. It is a source of reference for terminals seeking information on outstanding O. S. & D. items, for tracer information, and other O. S. & D. information. It also serves as the source for daily trends.

(j) The central office should compile discrepancy data on shippers, such as failure to mark shipments properly, and the use of poor quality containers. Such discrepancies should be called to the shipper's attention for correction.

(k) A daily conference call among terminals on the communications network should be established, preferably at an hour when telephone traffic is light and most of the inbound traffic is out for delivery. This provides the best opportunity to have a clear picture of the day's discrepancies. This call should be monitored by the central office since it provides information to and about all terminals.

(l) When teletype is used in lieu of telephone, messages should be short and meaningful, delivered on receipt to the O. S. & D. clerk and other addresses, and acted upon promptly.

Sec. 101-4.29 *Training.* (a) Training sessions should be held at each terminal location for all personnel in relation to their participation in the loss reporting procedures. Office, dock, and driving employees as well as management should participate in order to be acquainted fully with the carrier's practices involving O. S. & D.'s and reporting procedures.

(b) Personnel trained in the Loss Reporting System must of necessity be knowledgeable of the carriers's physical operations, routings, points served and terminal locations, as well as the care and handling of specialized cargo, hazardous materials, and high-risk cargo.

Sec. 101-4.31 *Review and Analysis.* (a) The Loss Reporting System's explicit purpose is loss prevention through intensified management of freight handling activities. Information developed in the Loss Reporting System will assist management in identifying problem areas within the system, and prompt corrective action.

(b) Periodic reports should indicate trends, problem areas, problem freight, problem customers, and problem employees and proposed corrective action. They will identify theft-prone areas and commodities.

(c) The report should advise management of the relationship of O. S. & D.'s to cargo claims filed, O. S. & D.'s to shortages never recovered, and O. S. & D.'s to claims never filed, billing errors, checker errors, and causes previously unknown or ignored.

(d) The report will also furnish data on other matters such as:

(1) Frequency of billing errors;

(2) Errors on S. L. & C. trailers at shipper's dock, where drivers signing for loads do not count the freight; and

(3) Packaging problems on S. L. & C.

(e) The report should also:

(1) Identify geographic areas of loss such as large distribution centers, high-value cargo shippers and receivers, and dangerous and hazardous material shipment problems;

(2) Provide data on frequency of shipments picked up that lack proper or complete address which prevent delivery or seriously delay shipment and cost carrier time and money in determining the correct identification; and

(3) Identify shipments pickup up lacking any markings which must be delayed until somewone with proper authority opens cartons and checks for identification in the form of packing slips, invoices, or advertising.

(f) The report can provide data on shippers who should unitize their small carton shipments. Small containers are easily lost, stolen, or damaged when shipped loose. These multiple small pieces are costly to the carrier in extra labor as well as claims exposure. Unitizing can reduce carrier's handling cost and protect contents of shipment from loss and damage.

(g) A periodic review of the Loss Reporting System and its results should be done by management to determine:

(1) Its effectiveness, and

(2) Methods for improvement.

[42 FR 45800, Sept. 12, 1977. Redesignated by Amdts. 85-1, and 101-1, 43 FR 43305, Sept. 25, 1978]

PART 101-5—PILFERABLE HIGH-VALUE OR SENSITIVE CARGO TRANSIT PROCEDURES

SUBPART A—GENERAL

Sec.

101-5.1 Purpose.
101-5.3 Application.
101-5.5 Definitions.

SUBPART B—ROUTING AND COMMUNICATION

101-5.11 General.
101-5.13 Routes.
101-5.15 Communication.
101-5.17 Escorts.

Sec.

SUBPART C—OPERATING PROCEDURES

101-5.21 General.
101-5.23 Delivery.
101-5.25 Seals.
101-5.27 Physical security.
101-5.29 Terminal security.
101-5.31 Security crib.
101-5.33 Supervisor responsibilities.

AUTHORITY: Sec. 9(c)(1), Department of Transportation Act (80 Stat. 944, 49 U.S.C. 1657(e)(1)), E.O. 11836 (3A CFR 123, Comp. (1975)), and sec. 101.3 of the Regulations of the Office of the Secretary of Transportation (49 CFR 101-3).

SUBPART A—GENERAL

SEC. 101-5.1 *Purpose.* (a) The purpose of this part is to set forth special transit procedures designed to protect high-value or sensitive cargo against theft and pilferage.

(b) The provisions herein are general and each may not apply to every transportation mode.

SEC. 101-5.3 *Application.* The guidelines presented herein apply equally to high-value or sensitive cargo in full load trailers/containers/rail cars moving in line haul and in less than full load shipments. Compliance with this advisory standard is voluntary and not mandatory. This standard does not repeal or modify any statutory requirement or regulatory authority vested in any Federal, State or local governmental body.

SEC. 101-5.5 *Definitions.* As used in this part.

"High-value cargo" means cargo which because of its monetary value, utility, desirability, or history of frequent theft requires greater protection than other commodities normally handled in the transportation facility. In addition, it includes commodities which are attractive, pilferable and highly salable, such as clothing, jewelry, and alcoholic beverages.

"Sensitive cargo" means cargo which because of its strategic value or potentially hazardous nature warrants greater security protection and care than other commodities normally handled in the transportation facility. Such sensitive cargo, if lost, could constitute a threat to law and order or to the safety and tranquility of the general public.

SUBPART B—ROUTING AND COMMUNICATION

SEC. 101-5.11 *General.* Routing and communications should be carefully planned for high-value or sensitive shipments. Written instructions to drivers would eliminate the possibility of a breakdown in personal communications or misunderstandings.

SEC. 101-5.13 *Routes.* (a) Whenever possible, travel should be restricted to limited access highways, turnpikes, freeways, etc.

(b) Unnecessary stops should be avoided. The shipment is most vulnerable when stopped.

(c) Trailers, containers or rail cars should be locked and protective devices activated.

(d) Estimated arrival times and delays should be expeditiously communicated to destination stations.

SEC. 101-5.15 *Communication.* (a) Where radios are available on local delivery vehicles, the route should be designated, and scheduled radio contact between the dispatcher and the vehicle should be maintained.

(b) For pickup or delivery vehicles without radio, the driver should telephone the dispatcher when leaving the shipper or arriving at the consignee, as appropriate. The dispatcher should notify the police if the driver does not contact him within the scheduled or reasonable time.

SEC. 101-5.17 *Escorts.* In cases where extremely high-value or sensitive cargo is transported, an escort should be used especially in areas which are high-risk or shipment is highly vulnerable. The escort should have radio communication with a central station. Any use of armed escorts must be in conformity with laws governing the use of firearms and armed escorts.

SUBPART C—OPERATING PROCEDURES

SEC. 101-5.21 *General.* The general details for high-value or sensitive cargo shipments should be standard operating procedures.

(a) To facilitate planning of necessary or special procedures, details of quantity, value, destination, etc., should be ascertained when initial pickup is arranged.

(b) High security padlocks should be provided on all pickup and delivery trucks.

(c) The dispatcher should know the identity of the shipper and consignee of each high-value or sensitive cargo and coordinate pickup and delivery with each.

(d) The company's operating procedures for transporting high-value or sensitive shipments should be published and maintained in each vehicle and at all loading terminals. The procedures should be readily accessible for use by drivers, shippers, consignees and dispatchers.

SEC. 101-5.23 *Delivery.* Every attempt should be made to have the load arrive at the local terminal for same-day delivery. This is extremely important in high-crime areas where cargo may be vulnerable in terminals or railyards.

SEC. 101-5.25 *Seals.* (a) Seal Accountability and Procedures are covered in Part 101-1 of this appendix.

(b) The use of security type seals is highly recommended. As a minimum, use security wire twist in conjunction with nonsecurity type seals.

(c) The serial number of a seal applied at the shipper's facility or the terminal should be recorded on the bill of lading and the manifest.

(d) The condition of the seal and its serial number should be checked upon entering and leaving each terminal or facility. The seal should also be checked by the driver after any other stops, and by railroad personnel on interchange of rail cars.

SEC. 101-5.27 *Physical security.* (a) Trailers, containers and rail car door hasps should be secured with a lock, wire or cable to deter the casual pilferer and delay more persistent thieves. Cable or wire twisted and secured through the safety latch, to be cut at destination, has proven to be an effective preventive measure.

(b) Door bolts, especially those on the locking bar and latch, should be peened or welded.

(c) Motion alarms are available commercially. These can be attached to trailers, containers and rail cars when parked to signal attempts at access or movement.

SEC. 101-5.29 *Terminal security.* (a) High-value or sensitive cargo temporarily placed on the dock or spotted in a railyard should be located in a special area which affords good visibility from the terminal office and should be checked frequently.

(b) Kingpin-locked trailers can be parked door-to-door to block access to other high-value or sensitive cargo. In the absence of kingpin locks, security can be achieved by hooking the tractor to the trailer, removing the ignition key and locking the tractor.

(c) Unauthorized persons should not be allowed entry into the terminal area.

(d) When company identification badges are used, they should be worn at all times by employees.

(e) Procedures should be established to have the count certified by drivers and loaders. Any exceptions should be reported immediately to the supervisor.

SEC. 101-5.31 *Security crib.* (a) High-value or sensitive cargo which cannot be outloaded immediately should be placed in a security crib or cage, in accordance with Part 101-2 of this Appendix, "High-Value Commodity Storage."

(b) The following should be recorded:

(1) The count and the name of the person doing the counting;

(2) The condition of the shipment; and

(3) The fact that the shipment was intact when placed in the crib.

(c) Cargo should only be removed from the crib when scheduled for immediate placement in a delivery or line unit. The count and condition should be certified by a supervisor.

SEC. 101-5.33 *Supervisor responsibilities.* (a) An effective loss control program requires participation by all supervisory personnel.

(b) A supervisor should inspect all bills of lading from incoming pickups promptly to identify high-value or sensitive items and provide necessary security.

(c) A supervisor should verify the count and condition when cargo is stripped from pickup or interline unit and direct the movement into the line trailer, container or rail car.

(d) Any overages, shortages or damages should be reported in accordance with Part 100-4 of this Appendix, "Cargo Loss Reporting System and Procedures."

(e) High-value or sensitive cargo should be loaded in the front end of the trailer, container or rail car. The supervisor should monitor the loading to ensure that the commodity is "buried" and to provide necessary documentation for accountability. Adherence to safe loading procedures is necessary to avoid overloading the front end or creation of unsafe conditions.

NOTE: OST Docket No. 32, containing all previous cargo security advisory standards and pertinent comments thereto, has been transferred from the Office of the Secretary to the Research and Special Programs Administration and is now available to the public in the Office of the Chief Counsel, Research and Special Programs Administration, Room 6222, Trans Point Building, 2100 Second Street SW., Washington, D.C. 20590. All future advisory standards will be published under RSP Docket No. 1.

[43 FR 24693, June 7, 1978. Redesignated by Amdts. 85-1 and 101-1, 43 FR 43305, Sept. 25, 1978]

SUBCHAPTER B—HAZARDOUS MATERIALS TRANSPORTATION AND PIPELINE SAFETY

PART 106—RULEMAKING PROCEDURES

Subpart A—General

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106.3 Delegations.
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106.9 Where to file petitions.

Subpart B—Procedures for Adoption of Rules

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106.15 Contents of notices of proposed rulemaking.
106.17 Participation by interested persons.
106.19 Petitions for extension of time to comment.
106.21 Contents of written comments.
106.23 Consideration of comments received.
106.25 Additional rulemaking proceedings.
106.27 Hearings.
106.29 Adoption of final rules.
106.31 Petitions for rulemaking.
106.33 Processing of petition.
106.35 Petitions for reconsideration.
106.37 Proceedings on petitions for reconsideration.
Appendix A

Authority: R.S. 4472(7) (46 U.S.C. 170(7)); sec. 902(h)(1), Pub. L. 85-726, 72 Stat. 784 (49 U.S.C. 1472(h)(1)); sec. 3, Pub. L. 90-481, 82 Stat. 720 (49 U.S.C. 1672); sec. 105, Pub. L. 93-633, 88 Stat. 2157 (49 U.S.C. 1804); sec. 21(a), Pub. L. 93-627, 88 Stat. 2146 (33 U.S.C. 1520); (18 U.S.C. 831-835) (49 CFR 1.45 and 1.53 and App. A of Part 1); Pub. L. 89-670 (49 U.S.C. 1653(d), 1653, 1657(e)).

Source: 40 FR 31768, July 29, 1975, unless otherwise noted. Redesignated by Amdt. 102-1, and Amdt. 106-1, 43 FR 43306, Sept. 25, 1978.

Editorial Note: Nomenclature changes to Part 106 appear at 43 FR 43307, Sept. 25, 1978 (Amdts. 102-1, and 106-1) and at 50 FR 45729, Nov. 1, 1985.

Subpart A—General

§ 106.1 Scope.

This part prescribes general rulemaking procedures for the issue, amendment, and repeal of regulations of the Research and Special Programs Administration of the Department of Transportation.

§ 106.3 Delegations.

For the purposes of this part, "Administrator" means the Administrator, Research and Special Programs Administration or any of the following to whom he has delegated authority to conduct rulemaking proceedings:

(a) Director, Office of Hazardous Materials Transportation.

(b) Director, Office of Pipeline Safety.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53(e))

[40 FR 31768, July 29, 1975. Redesignated by Amdts. 102-1 and 106-1, 43 FR 43306, Sept. 25, 1978, and amended by Amdt. 106-2, 43 FR 48642, Oct. 19, 1978]

§ 106.5 Regulatory dockets.

(a) Information and data considered relevant by the Administrator relating to rulemaking actions, including notices of proposed rulemaking; comments received in response to notices; petitions for rulemaking and reconsideration; denials of petitions for rulemaking and reconsideration; records of additional rulemaking proceedings under § 106.25; and final regulations are maintained by the Research and Special Programs Administration at 400 7th Street, SW, Washington, D.C. 20590.

(b) Any person may examine any docketed material at the offices of the Research and Special Programs Administration at any time during regular business hours after the docket is established, except material which the Administrator determines should be withheld from public disclosure under applicable provisions of any statute administered by the Administrator and section 552(b) of Title 5, United States Code, and may obtain a copy of it upon payment of a fee.

[40 FR 31758, July 29, 1975. Redesignated by Amdts. 102-1 and 106-1, 43 FR 43306, Sept. 25, 1978, and amended by Amdt. 106-3, 45 FR 81571, Dec. 11, 1980]

§ 106.7 Records.

Records of the Research and Special Programs Administration relating to rulemaking proceedings are available for inspection as provided in section 552(b) of Title 5, United States Code, and Part 7 of the Regulations of the Office of the Secretary of Transportation (Part 7 of this title).

§ 106.9 Where to file petitions.

Petitions for extension of time to comment submitted under § 106.19, petitions for hearings submitted under § 106.27, petitions for rulemaking submitted under § 106.31, and petitions for reconsideration submitted under § 106.35 must be submitted to: Administrator, Research and Special Programs Administration, U.S. Department of Transportation, 400 7th Street, SW, Washington, D.C. 20590.

[40 FR 31768, July 29, 1975. Redesignated by Amdts. 102-1 and 106-1, 43 FR 43306, Sept. 25, 1978, and amended by Amdt. 106-3, 45 FR 81571, Dec. 11, 1980]

Subpart B—Procedures for Adoption of Rules

§ 106.11 General.

Unless the Administrator, for good cause, finds that notice is impracticable, unnecessary, or contrary to the public interest, and incorporates that finding and a brief statement of the reasons for it in the rule, a notice of proposed rulemaking is issued and interested persons are invited to participate in the rulemaking proceedings with respect to each substantive rule.

§ 106.13 Initiation of rulemaking.

The Administrator initiates rulemaking on his own motion. However, in so doing, he may, in his discretion, consider the recommendations of other agencies of the United States or of other interested persons including those of any technical advisory body established by statute for that purpose.

§ 106.15 Contents of notices of proposed rulemaking.

(a) Each notice of proposed rulemaking is published in the FEDERAL REGISTER, unless all persons subject to it are named and are personally served with a copy of it.

(b) Each notice, whether published in the FEDERAL REGISTER or personally served, includes:

(1) A statement of the time, place, and nature of the proposed rulemaking proceeding;

(2) A reference to the authority under which it is issued;

(3) A description of the subjects and issues involved or the substance and terms of the proposed regulation;

(4) A statement of the time within which written comments must be submitted; and

(5) A statement of how and to what extent interested persons may participate in the proceeding.

§ 106.17 Participation by interested persons.

(a) Any interested person may participate in rulemaking proceedings by submitting comments in writing containing information, views or arguments.

(b) In his discretion, the Administrator may invite any interested person to participate in the rulemaking proceedings described in § 106.25.

(c) For the purposes of this part, an interested person includes any Federal or State government agency or any political subdivision of a State (as defined in § 107.201(b) of this subchapter).

(49 U.S.C. 1803, 1804, 1808, and 1809; 49 CFR 1.53, App. A to Part 1)

[40 FR 31768, July 29, 1975. Redesignated by Amdt. 102-1, and Amdt. 106-1, 43 FR 43306, Sept. 25, 1978, and amended by Amdt. 106-4, 48 FR 2651, Jan. 20, 1983]

§ 106.19 Petitions for extension of time to comment.

A petition for extension of the time to submit comments must be received not later than 10 days before expiration of the time stated in the notice. It is requested, but not required, that three copies be submitted. The filing of the petition does not automatically extend the time for petitioner's comments. A petition is granted only if the petitioner shows good cause for the extension, and if the extension is consistent with the public interest. If an extension is granted, it is granted to all persons, and it is published in the FEDERAL REGISTER.

§ 106.21 Contents of written comments.

All written comments must be in English. It is requested, but not required, that five copies be submitted. Any interested person must submit as part of his written comments all the material that he considers relevant to any statement of fact made by him. Incorporation of material by reference is to be avoided. However, if such incorporation is necessary, the incorporated material shall be identified with respect to document and page.

§ 106.23 Consideration of comments received.

All timely comments and the recommendations of any technical advisory body established by statute for the purpose of reviewing the proposed rule concerned are considered before final action is taken on a rulemaking proposal. Late filed comments are considered so far as practicable.

§ 106.25 Additional rulemaking proceedings.

The Administrator may initiate any further rulemaking proceedings that he finds necessary or desirable. For example, interested persons may be invited to make oral arguments, to participate in conferences between the Administrator or his representative and interested persons at which minutes of the conference are kept, to appear at informal hearings presided over by officials designated by the Administrator at which a transcript of minutes are kept, or participate in any other proceeding to assure informed administrative action and to protect the public interest.

§ 106.27 Hearings.

(a) If a notice of proposed rulemaking does not provide for a hearing, any interested person may petition the Administrator for an informal hearing. The petition must be received by the Administrator not later than 20 days before expiration of the time stated in the notice. The filing of the petition does not automatically result in the scheduling of a hearing. A petition is granted only if the petitioner shows good cause for a hearing. If a petition for a hearing is granted, notice of the hearing is published in the FEDERAL REGISTER.

(b) Sections 556 and 557 of Title 5, United States Code, do not apply to hearings held under this part. Unless otherwise specified, hearings held under this part are informal, nonadversary, fact-finding proceedings, at which there are not formal pleadings or adverse parties. Any regulation issued in a case in which an informal hearing is held is not necessarily based exclusively on the record of the hearing.

(c) The Administrator designates a representative to conduct any hearing held under this part. The Chief Counsel designates a member of his staff to serve as legal officer at the hearing.

§ 106.29 Adoption of final rules.

Final rules are prepared by representatives of the office concerned and the Office of the Chief Counsel. The regulation is then submitted to the Administrator for his consideration. If the Administrator adopts the regulation, it is published in the FEDERAL REGISTER, unless all persons subject to it are named and are personally served with a copy of it.

§ 106.31 Petitions for rulemaking.

(a) Any interested person may petition the Administrator to establish, amend, or repeal a regulation.

(b) Each petition filed under this section must:

(1) Set forth the text or substance of the regulation or amendment proposed, or specify the rule that the petitioner seeks to have repealed, as the case may be;

(2) Explain the interest of the petitioner in the action requested; and

(3) Contain any information and arguments available to the petitioner to support the action sought.

§ 106.33 Processing of petition.

(a) *General.* Unless the Administrator otherwise specifies, no public hearing, argument, or other proceeding is held directly on a petition before its disposition under this section.

(b) *Grants.* If the Administrator determines that the petition contains adequate justification, he initiates rulemaking action under this Subpart B.

(c) *Denials.* If the Administrator determines that the petition does not justify rulemaking, he denies the petition.

(d) *Notification.* Whenever the Administrator determines that a petition should be granted or denied, the Office of the Chief Counsel prepares a notice of that grant or denial for issuance to the petitioner, and the Administrator issues it to the petitioner.

§ 106.35 Petitions for reconsideration.

(a) Any interested person may petition the Administrator for reconsideration of any regulation issued under this part. It is requested, but not required, that three copies be submitted. The petition must be received not later than 30 days after publication of the rule in the FEDERAL REGISTER. Petitions filed after that time will be considered as petitions filed under § 106.31. The petition must contain a brief statement of the complaint and an explanation as to why compliance with the rule is not practicable, is unreasonable, or is not in the public interest.

(b) If the petitioner requests the consideration of additional facts, he must state the reason they were not presented to the Administrator within the prescribed time.

(c) The Administrator does not consider repetitious petitions.

(d) Unless the Administrator otherwise provides, the filing of a petition under this section does not stay the effectiveness of the rule.

§ 106.37 Proceedings on petitions for reconsideration.

(a) The Administrator may grant or deny, in whole or in part, any petition for reconsideration without further proceedings. In the event he determines to reconsider any regulation he may issue a final decision on reconsideration without further proceedings, or he may provide such opportunity to submit comment or information and data as he deems appropriate. Whenever the Administrator determines that a petition should be granted or denied, the Office of Chief Counsel prepares a notice of the grant or denial of a petition for reconsideration, for issuance to the petitioner, and the Administrator issues it to the petitioner. The Administrator may consolidate petitions relating to the same rules.

(b) It is the policy of the Administrator to issue notice of the action taken on a petition for reconsideration within 90 days after the date on which the regulation in question is published in the FEDERAL REGISTER, unless it is found impracticable to take action within that time. In cases where it is so found and the delay beyond that period is expected to be substantial, notice of that fact and the date by which it is expected that action will be taken is issued to the petitioner and published in the FEDERAL REGISTER.

APPENDIX A

Pursuant to § 106.3, the following officials of the Research and Special Programs Administration are authorized to conduct rulemaking proceedings under this part, as specified in this appendix.

(a) The Director, Office of Hazardous Materials Transportation is authorized to conduct all rulemaking proceedings, other than those concerning compliance, enforcement, and preemption matters, except the issuance of final rules and the grant or denial of petitions for reconsideration, under:

(1) R.S. 4472(7), 46 U.S.C. 170(7), except to the extent it relates to: (i) Ship's stores and supplies, or (ii) the bulk transportation of hazardous materials which are loaded or carried onboard a vessel without benefit of containers or labels, and received and handled by the vessel without mark or count;

(2) Section 902(h)(1) of the Federal Aviation Act, as amended, 49 U.S.C. 1472(h)(1); and

(3) The Hazardous Materials Transportation Act, 49 U.S.C. 1801 et seq., except to the extent it relates to: (i) Ship's stores or supplies, (ii) the bulk transportation of hazardous materials which are loaded or carried onboard a vessel without benefit of containers or labels, and received and handled by the vessel without mark or count, or (iii) pipelines.

(b) The Director, Office of Pipeline Safety is authorized to conduct all rulemaking proceedings, other than those concerning compliance and enforcement matters, except the issuance of final rules and the grant or

denial of petitions for reconsideration,
under:
(1) The Hazardous Liquid Pipeline Safety
Act of 1979 (Title II of Pub. L. 96-129, 93
Stat. 1003, 49 U.S.C. 2001 et seq.);
(2) The Natural Gas Pipeline Safety Act
of 1968, as amended, 49 U.S.C. 1671 et seq.;
(3) Section 21(a) of the Deepwater Port
Act of 1974, 33 U.S.C. 1520(a).

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53(e))

[Amdt. 106-1, 43 FR 43307, Sept. 25, 1978;
43 FR 45386, Oct. 2, 1978; Amdt. 106-2, 43
FR 48642, Oct. 19, 1978; Amdt. 106-1, 45 FR
14577, Mar. 6, 1980; 50 FR 45729, Nov. 1,
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PART 107—HAZARDOUS MATERIALS PROGRAM PROCEDURES

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SOURCE: 40 FR 48470, Oct. 15, 1975, unless otherwise noted.

EDITORIAL NOTE: Nomenclature changes to Part 107 appear at 43 FR 43307, Sept. 25, 1978 (Amdt. 107-4), 43 FR 48642, Oct. 19, 1978 (Amdt. 107-5) and at 50 FR 45729, Nov. 1, 1985.

Subpart A—General Provisions

§ 107.1 Purpose and scope.

(a) This part prescribes procedures utilized by the Research and Special Programs Administration, the Office of Hazardous Materials Transportation and the Office of Chief Counsel in carrying out their duties under the laws pertaining to the transportation of hazardous materials.

(b) This subpart defines certain terms and prescribes procedures that are applicable to each proceeding described in this part.

[40 FR 48470, Oct. 15, 1975, as amended by Amdt. 107-4, 43 FR 43307, Sept. 25, 1978]

§ 107.3 Definitions.

As used in this part:

"Act" means the Hazardous Materials Transportation Act.

"Approval Agency" means an organization or a person designated by the RSPA to certify packagings as having been designed, manufactured, tested, modified, marked or maintained in compliance with applicable DOT regulations.

"Competent Authority" means a national agency responsible under its national law for the control or regulation of a particular aspect of the transportation of hazardous materials (dangerous goods). The term "Appropriate authority", as used in the ICAO Technical Instructions, has the same meaning as "Competent Authority". The Director, Office of Hazardous Materials Transportation, Research and Special Programs Administration, is the United States Competent Authority for purposes of this part.

"OHMT" means the Office of Hazardous Materials Transportation.

"Person" includes a corporation, company, association, firm, partnership, society, and joint stock company, joint venture, sole proprietorship, as well as any officer, director, owner or duly authorized representative of any such unit or an individual.

"Respondent" means a person upon whom the RSPA has served a notice of probable violation.

"State" means a State of the United States, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, American Samoa, or Guam.

[Amdt. 107-3, 41 FR 38170, Sept. 9, 1976, as amended by Amdt. 107-4, 43 FR 43307, Sept. 25, 1978; Amdt. 107-5, 43 FR 48642, Oct. 19, 1978; Amdt. 107-8, 46 FR 9888, Jan. 29, 1981; Amdt. 107-12, 48 FR 53711, Nov. 29, 1983; 50 FR 45730, Nov. 1, 1985]

§ 107.5 Request for confidential treatment.

(a) If any person filing a document with the OHMT claims that some or all the information contained in the document is exempt from the mandatory public disclosure requirements of the Freedom of Information Act (5 U.S.C. 552 (1970)), is information referred to in 18 U.S.C. 1905 (1970), or is otherwise exempt by law from public disclosure, and if that person requests the OHMT not to disclose the information, that person shall file together with the documents a second copy of the document from which has been deleted the information for which confidential treatment is claimed. The person shall indicate in the original document that it is confidential or contains confidential information and may file a statement specifying the justification for which confidential treatment is claimed. If the person states that the information comes within the exception in 5 U.S.C. 552(b)(4) for trade secrets and commercial or financial information, that person must include a statement as to why the information is privileged or confidential. If the person filing a document does not submit a second copy of the document with the confidential information deleted, the OHMT may assume that there is no objection to public disclosure of the document in its entirety.

(b) The OHMT retains the right to make its own determination with regard to any claim of confidentiality. Notice of a decision by the OHMT to deny the claim, in whole or in part, and an opportunity to respond shall be given to a person claiming confidentiality of information no less than five days prior to its public disclosure.

§ 107.7 Service of process on non-residents of the United States.

(a) *Designation of agent for service.* When a person who is not a resident of the United States is required by this subchapter or Subchapter C of this chapter to designate a permanent resident of the United States as his agent upon whom service of process may be made for him and on his behalf, the agent may be an individual, a firm, or a domestic corporation. Any number of principals may designate the same person as agent. A designation is binding on a principal even if the designation is not in compliance with all the requirements of this section, until rejected by the OHMT. A designated agent may not assign performance of his functions under the designation to another person.

(b) *Form and contents of designation.* The designation shall:

(1) Be in writing and dated;

(2) Be made in the legal form required to make it valid and binding on the principal under the laws, corporate bylaws, or other requirements governing the making of the designation by the principal at the place and time where it is made and the person or persons signing the designation shall certify that it is so made;

(3) State the full legal name, principal name of business and mailing address of the principal;

(4) Provide that it remains in effect until withdrawn or replaced by the principal;

(5) State the legal name and mailing address of the agent; and

(6) Bear a declaration of acceptance duly signed by the designated agent.

(c) *Method of service.* Service of any process, notice, order, decision, or requirement of the OHMT may be made by registered or certified mail addressed to the agent with return receipt requested or in any other manner authorized by law. If service cannot be effected because the agent has died (or, if a firm or a corporation ceases to exist) or moved, or otherwise does not receive correctly addressed mail, service may be made by publication in the FEDERAL REGISTER.

[Amdt. 107-2, 41 FR 7509, Feb. 19, 1976]

§ 107.9 Public docket room.

There is established in the RSPA offices at 400 7th Street, SW., Washington, D.C., a public docket room in which there is available for public inspection and copying:

(a) Copies of notices of proposed rulemaking issued by the RSPA or its predecessor agency, including advance notices, together with the comments received thereon during rulemaking proceedings, copies of any related FEDERAL REGISTER notices, final rules, petitions for reconsideration, and decisions issued in response to petitions for reconsideration;

(b) Applications for exemptions from the Department of Transportation's regulations governing the transportation of hazardous materials, including supporting data, memoranda of any informal meetings with applicants, related FEDERAL REGISTER notices, comments received thereon during the public comment period and copies of decisions issued granting or denying applications for exemptions;

(c) Applications for inconsistency rulings and nonpreemption determinations under Subpart C of this part, together with the comments received thereon, related documents filed with the RSPA, copies of related FEDERAL REGISTER notices, and rulings, determinations and orders issued in response to those applications;

(d) Records of compliance order proceedings and copies of RSPA compliance orders;

(e) Appeals filed under this part and RSPA decisions issued in response to those appeals; and

(f) Such other information pertaining to the RSPA's hazardous materials program required by statute to be made available for public inspection and copying and any information which the RSPA determines should be made available to the public.

[Amdt. 107-3, 41 FR 38170, Sept. 9, 1976, as amended by Amdt. 107-8, 45 FR 81571, Dec. 11, 1980]

§ 107.11 Service.

(a) Each order, notice, or other document required to be served under this part shall be served personally or by registered or certified mail, except as otherwise provided.

(b) Service upon a person's duly authorized representative constitutes service upon that person.

(c) Service by registered or certified mail is complete upon mailing. An official United States Postal Service receipt from the registered or certified mailing constitutes prima facie evidence of service.

[Amdt. 107-3, 41 FR 38170, Sept. 9, 1976]

§ 107.13 Subpoenas, witness fees.

(a) The Administrator, RSPA, the Chief Counsel, Research and Special Programs Administration, or the Official designated to preside over a hearing convened in accordance with this part, may sign and issue subpoenas either on his own initiative or, upon an adequate showing that the information sought will materially advance the proceeding, upon the request of any person participating in that proceeding.

(b) A subpoena may require the attendance of a witness, or the production of documentary or other tangible evidence in the possession or under the control of the person served, or both.

(c) A subpoena may be served personally by any person who is not an interested person and is not less than 18 years of age, or by certified or registered mail.

(d) Service of a subpoena upon the person named therein shall be made by delivering a copy of the subpoena to such person and by tendering the fees for one day's attendance and mileage as specified by paragraph (f) of this section. When a subpoena is issued at the instance of any officer or agency of the United States, fees and mileage need not be tendered at the time of service. Delivery of a copy of a subpoena and tender of the fees to a natural person may be made by handing them to the person, leaving them at his office with the person in charge thereof, leaving them at his dwelling place or usual place of abode with some person of suitable age and discretion then residing therein, by mailing them by registered or certified mail to him at his last known address, or by any method whereby actual notice is given to him and the fees are made available prior to the return date. When the person to be served is not a natural person, delivery of a copy of the subpoena and tender of the fees may be effected by handing them to a registered agent for service, or to any officer, director, or agent in charge of any office of the person, or by mailing them by registered or certified mail to that representative at his last known address or by any method whereby actual notice is given to the representative and the fees are made available prior to the return date.

(e) The original subpoena bearing a certificate of service shall be filed with the RSPA official having responsibility for the proceeding in connection with which the subpoena was issued.

(f) A witness subpoenaed by the RSPA shall be paid the same fees and mileage as would be paid to a witness in a proceeding in the district courts of the United States. The witness fees and mileage shall be paid by the person at whose instance the subpoena was issued.

(g) Notwithstanding the provisions of paragraph (f) of this section, and upon request, the witness fees and mileage may be paid by the RSPA if the RSPA official who issued the subpoena determines on the basis of good cause shown, that:

(1) The presence of the subpoenaed witness will materially advance the proceeding; and

(2) The person at whose instance the subpoena was issued would suffer a serious hardship if required to pay the witness fees and mileage.

(h) Any person to whom a subpoena is directed may apply no later than 10 days after service thereof, to the person who issued the subpoena to quash or modify it. The application shall contain a brief statement of the reasons relied upon in support of the action sought therein. The person who issued the subpoena may:

(1) Deny the application;

(2) Quash or modify the subpoena; or

(3) Condition denial of the application to quash or modify the subpoena upon the satisfaction of certain just

and reasonable requirements. The denial may be summary.

(i) If there is a refusal to obey a subpoena served upon any person under the provisions of this section, the RSPA may request the Attorney General to seek the aid of the United States District Court for any District in which the person is found to compel that person, after notice, to appear and give testimony, or to appear and produce the subpoenaed documents before the RSPA, or both.

(49 U.S.C. 1803, 1804, 1808, and 1809; 49 CFR 1.53, App. A to Part 1)

[Amdt. 107-3, 41 FR 38170, Sept. 9, 1976, as amended by Amdt. 107-11, 48 FR 2651, Jan. 20, 1983]

Subpart B—Exemptions

§ 107.101 Purpose and scope.

This subpart prescribes procedures by which persons who are subject to the requirements of this subchapter, Subchapter C of this chapter, 46 CFR Part 64 or Part 146 may obtain administrative relief therefrom on the basis of equivalent levels of safety or levels of safety consistent with the public interest and the policy of the Hazardous Materials Transportation Act.

[40 FR 48470, Oct. 15, 1975, as amended by Amdt. 107-4, 43 FR 43308, Sept. 25, 1978]

§ 107.103 Application for exemption.

(a) Any person who is subject to the requirements of this subchapter, Subchapter C of this chapter, 46 CFR Part 64 or Part 146 may apply to the Director, OHMT, for an exemption from those requirements.

(b) Each application filed under this section for an exemption must:

(1) Be submitted in triplicate to: Office of Hazardous Materials Transportation, U.S. Department of Transportation, Washington, D.C. 20590, Attention: Exemptions Branch;

(2) Set forth the text or substance of the regulation from which the exemption is sought;

(3) State the name, address, and telephone number of the applicant;

(4) Include a detailed description of the proposal, including when appropriate, drawings, plans, calculations, procedures, test results, previous exemptions, approvals or permits, a list of specification containers, if any, to be used, a list of modified specification containers, if any, to be used, and a description of the modifications, and any other supporting information;

(5) State the chemical name, common name, hazard classification, form, quantity, properties, and characteristics of the material covered by the proposal, including composition and percentage (specified by volume or weight) of each chemical, if a solution or mixture;

(6) Describe all relevant shipping and accident experience;

(7) Specify the proposed mode of transportation, identify any increased risks that are likely to result if the exemption is granted, and specify the safety control measures which the applicant considers necessary or appropriate to compensate for those increased risks;

(8) Specify the proposed duration or describe the proposed schedule of events for which the exemption is sought;

(9) State why the applicant believes the proposal including any safety control measures specified by the applicant will achieve a level of safety which:

(i) Is at least equal to that specified in the regulation from which the exemption is sought, or

(ii) If the regulations do not contain a specified level of safety, will be consistent with the public interest and will adequately protect against the risks to life and property which are inherent in the transportation of hazardous materials in commerce;

(10) If the applicant seeks to have the application processed on a priority basis, set forth the supporting facts and reasons and

(11) If the applicant is not a resident of the United States, include a designation of a permanent resident of the United States as his agent for service of process in accordance with § 107.7.

(c) Unless the Director, OHMT, finds that there is good reason for priority processing of an application, each application is processed in the order in which it is received. To permit timely consideration, an application should be submitted at least 120 days before the requested effective date.

(d) If the applicant wishes to claim confidential treatment for any information contained in the application, the procedures set forth in § 107.5 apply.

[40 FR 48470, Oct. 15, 1975, as amended by Amdt. 107-2, 41 FR 7509, Feb. 19, 1976; Amdt. 107-4, 43 FR 43308, Sept. 25, 1978]

§ 107.105 Application for renewal.

(a) Each application for the renewal of an exemption issued under this subpart must:

(1) Be submitted in triplicate to: Office of Hazardous Materials Transportation, U.S. Department of Transportation, Washington, D.C. 20590, Attention: Exemptions Branch;

(2) Identify the exemption for which a renewal is requested;

(3) State the name, address, and telephone number of the applicant;

(4) Include (i) a certification by the applicant that the descriptions, technical information and safety assessment submitted in the original application, or as may have been updated by any subsequent application for renewal, remain accurate and correct, or (ii) such amendments to the previously submitted descriptions, technical information and safety assessment as is necessary to update them and assure their accuracy and correctness;

(5) A statement describing all relevant shipping and all accident experience that has occurred in connection with the exemption since its issuance or most recent renewal or, if no accidents have been experienced, a certification to that effect. This statement must include the approximate number of shipments made or packages shipped, as the case may be, and the number of shipments or packages involved in any loss of contents, including loss by venting when transporting a compressed or cold temperature gas.

(b) To permit timely consideration, an application for renewal should be submitted at least 60 days before the expiration date of the exemption.

(c) If, at least 60 days prior to the expiration of an existing exemption of a continuing nature, the holder files an application for renewal which is complete and conforms with the requirements of this section, the exemption will not be considered to have expired until the application for renewal has been finally determined.

(d) Paragraphs (a) and (b) of this section notwithstanding, an application received after October 15, 1975, and before December 16, 1975, seeking the renewal of a special permit, exemption, waiver, deviation or any other similar form of administrative relief from the requirements of Subchapter C of this chapter, 46 CFR Part 64 or Part 146 issued under procedures superseded by this subpart will be processed in the manner prescribed in this subpart if that application contains all of the information that would have been required for renewal under the superseded procedure. An application received after December 15, 1975, seeking renewal of administrative relief granted under procedures superseded by this subpart, must contain the information required by paragraph (a) of this section.

[40 FR 48470, Oct. 15, 1975, as amended by Amdt. 107-4, 43 FR 43308, Sept. 25, 1978]

§ 107.107 Administrative review.

In the case of a written application for an exemption submitted as provided in § 107.103(b) or the renewal of an exemption submitted as provided in § 107.105, the Director, OHMT, reviews it to determine whether it is complete and conforms with the requirements of this subpart. This determination will be made within 30 days of the receipt of an exemption application and within 15 days of the receipt of a renewal application. If it is not returned to the applicant by the end of that period, it will be processed as provided in § 107.109. If an application is returned, the applicant will be informed in what respects the application is incomplete.

§ 107.109 Processing of application.

(a) After an application for an exemption or renewal of an exemption is determined to be complete, the Director, OHMT, dockets the application and publishes a notice in the FEDERAL REGISTER affording an opportunity for interested persons to comment. All comments received before the close of the comment period are considered before final action is taken on an application.

(b) No public hearing, argument, or other formal processing is held directly on an application filed under this subpart before its disposition under this section. However, during the processing of an application the Director, OHMT, may require the applicant to supply additional information.

(c) The Director, OHMT denies an application in accordance with the following:

(1) The application is denied if it does not contain adequate justification or if it contains any materially false or materially misleading statements, or fails to state a material fact.

(2) If the Director, OHMT denies an application under this paragraph, he notifies the applicant in writing of his reason therefore and publishes notice of the denial in the FEDERAL REGISTER.

(d) If the Director, OHMT, determines that the application contains adequate justification, he grants it subject to the conditions set forth in Appendix B to this subpart and such other terms as he considers necessary, and notifies the applicant in writing. He also publishes in the FEDERAL REGISTER a notice of the grant.

(e) If the Director, OHMT, determines that an application concerns a matter of such general applicability and future effect as to warrant being made the subject of rule making, he may initiate rule making under Part 106 of this chapter in addition to or in lieu of granting or denying the application.

(49 U.S.C. 1803, 1804, 1808, and 1809; 49 CFR 1.53, App. A to Part 1)

[40 FR 48470, Oct. 15, 1975, as amended by Amdt. 107-8, 45 FR 81571, Dec. 11, 1980; Amdt. 107-11, 48 FR 2651, Jan. 20, 1983]

§ 107.111 Party to an exemption.

(a) Any person who is eligible to apply under § 107.103 for an exemption may apply to the Director, OHMT, to be made a party to an application filed under that section or § 107.105 or to an exemption or renewal granted under § 107.109(d).

(b) Each application filed under this section must:

(1) Be submitted to: Office of Hazardous Materials Transportation, U.S. Department of Transportation, Washington, D.C. 20590, Attention: Exemptions Branch;

(2) Identify the exemption application or exemption to which the applicant seeks to become a party;

(3) State the name, address and telephone number of the applicant and

(4) If the applicant is not a resident of the United States, include a designation of a permanent resident of the United States as his agent for service of process in accordance with § 107.7.

(c) The applicant becomes a party to an exemption application or exemption if the Director, OHMT, determines that:

(1) The applicant is a person who is eligible to apply under § 107.103 for an exemption; and

(2) The exemption application or exemption to which the applicant seeks to become a party concerns a matter of a continuing nature and does not depend upon information entitled to confidential treatment.

(d) The Director, OHMT, publishes in the FEDERAL REGISTER a notice of each application received, each initial determination made and each renewal granted under this section.

(e) A person who becomes a party to an exemption under this section is subject to terms of that exemption, including the expiration date stated therein. If a party to an exemption wishes to renew his status as a party to an exemption, the procedures set forth in §§ 107.105 through 107.109 with respect to an application for renewal of an exemption apply.

[40 FR 48470, Oct. 15, 1975, as amended by Amdt. 107-1, 40 FR 56443, Dec. 3, 1975; Amdt. 107-2, 41 FR 7509, Feb. 19, 1976]

§ 107.113 Application for and processing of emergency exemption.

(a) Any person who is subject to the requirements of this subchapter, Subchapter C of this chapter, 46 CFR Part 64 or Part 146 who seeks an exemption from any of those requirements on the basis of an existing emergency shall apply for that exemption through the appropriate Department of Transportation official listed in Appendix A to this subpart.

(b) An application submitted under this section must include such supporting information with respect to each of the topics specified in § 107.103(b) (2) through (11) as the receiving Department of Transportation official considers necessary for processing the application.

(c) Upon receipt of all of the information necessary for processing the application, the receiving Department of Transportation official shall transmit to the Director, OHMT, by the most rapid available means of communication, his evaluation as to whether an emergency exists and his recommendations with respect to the conditions to be included in the exemption. If the Director, OHMT, determines that an emergency exists and that there is adequate justification for the exemption, he grants the exemption subject to the applicable conditions set forth in Appendix B to this subpart and such other terms as he considers necessary, and immediately notifies the applicant. If the Director, OHMT, cannot determine that an emergency exists or determines that there is not adequate justification for the exemption, he immediately so notifies the applicant.

[40 FR 48470, Oct. 15, 1975, as amended by Amdt. 107-1, 40 FR 56443, Dec. 3, 1975; Amdt. 107-2, 41 FR 7509, Feb. 19, 1976; Amdt. 107-4, 43 FR 43308, Sept. 25, 1978]

§ 107.115 Determination of existing emergency.

(a) The Director, OHMT, shall determine that an emergency exists if, on the basis of information submitted in the application and his own investigation, he finds that:

(1) Existing conditions require the hazardous material concerned to be transported in commerce for the protection of life or property (other than the hazardous material to be transported); and

(2) The protection of life or property to be provided by the hazardous material would not be possible if the application is processed on a routine basis.

(b) The Director, OHMT, may determine that an emergency exists if, on the basis of information submitted in the application, he finds that:

(1) Existing conditions require the hazardous material concerned to be transported in commerce to prevent or minimize serious economic loss; and

(2) The prevention or minimizing of serious economic loss to be provided by the hazardous material would not be possible if the application is processed on a routine basis.

(c) In determining what constitutes serious economic loss under paragraph (b) of this section, the Director, OHMT, considers the nature and extent of the expected loss.

§ 107.117 Withdrawal.

(a) An applicant may withdraw an application at any time prior to it being finally determined. When an application is withdrawn after publication of the notice of application in the FEDERAL REGISTER, the Director, OHMT, publishes a notice of withdrawal in the FEDERAL REGISTER.

(b) Except for documents for which confidential treatment was requested by the applicant, withdrawal of an application does not authorize the removal of any related records from the dockets or files of the RSPA.

§ 107.119 Amendment, suspension, termination, and referral for enforcement action.

(a) An exemption and any renewal thereof terminates according to its terms but not later than two years after the date of issuance unless terminated sooner under paragraph (c) of this section.

(b) The Director, OHMT may amend or suspend an exemption if:

(1) He determines that an activity under the exemption is not being performed in accordance with the terms of the exemption; or

(2) On the basis of information not available at the time the exemption was granted or renewed, such action is necessary to protect against risk to life or property.

(c) The Director, OHMT may terminate an exemption if:

(1) He determines that the exemption is no longer consistent with the public interest;

(2) The exemption is no longer necessary because of an amendment to the regulations; or

(3) The exemption was granted on the basis of false or misleading material information.

(d) Unless the Director, OHMT determines that immediate amendment, suspension, or termination of an exemption is necessary to abate the risk of an imminent hazard, he notifies the holder of the exemption or a party thereto in writing of the reasons therefore and provides that person an opportunity to show cause why the exemption should not be amended, suspended, or terminated under paragraph (b) or (c) of this section.

(e) Notwithstanding paragraphs (b), (c) and (d) of this section, the Director, OHMT may refer an exemption to the Office of Chief Counsel for initiation of an enforcement case under Subpart D of this part. If, as the result of the enforcement proceeding, the holder of the exemption or a party thereto is determined to have violated the terms of the exemption, the Director, OHMT may amend, suspend, or terminate the exemption.

(49 U.S.C. 1803, 1804, 1808, and 1809; 49 CFR 1.53, App. A to Part 1)

[Amdt. 107-11, 48 FR 2651, Jan. 20, 1983]

§ 107.121 Appeal.

Any applicant for an exemption or the renewal of an exemption aggrieved by an action taken by the Director, OHMT, under this subpart and any holder of an exemption suspended or terminated by the Director, OHMT, under § 107.119 (b) or (c) may file an appeal with the Administrator, RSPA. The appeal must be filed within 30 days of service of notification of that action, suspension or termination. There has not been an exhaustion of administrative remedies until an appeal has been filed and the appellate process is completed by the issuance of an order by the Administrator, RSPA, granting or denying the appeal.

[40 FR 48470, Oct. 15, 1975, as amended by Amdt. 107-10, 47 FR 43064, Sept. 30, 1982]

§ 107.123 Availability for public inspection.

(a) Information relevant to an application under this part, including the application and supporting data, memoranda of any informal meetings with the applicant, and the grant or denial of the application is available for public inspection, except as specified in paragraph (b) of this section, at the Office of Hazardous Materials Transportation, 400 7th Street, SW., Washington, D.C. 20590. Copies of available information may be obtained, as provided in Part 7 of this title.

(b) Information made available for inspection does not include materials which the Director, OHMT, determines should be withheld from public disclosure under § 107.5 and in accordance with the applicable provisions of section 552(b) of Title 5, United States Code, and Part 7 of this title.

[40 FR 48470, Oct. 15, 1975, as amended by Amdt. 107-6, 45 FR 81571, Dec. 11, 1980]

APPENDIX A TO SUBPART B—LIST OF DEPARTMENT OF TRANSPORTATION OFFICIALS THROUGH WHOM APPLICATION FOR EXEMPTIONS SEEKING PRIORITY TREATMENT ON THE BASIS OF EXISTING EMERGENCIES MAY BE INITIALED BY TELEPHONE

CERTIFICATE HOLDING AIRCRAFT OPERATIONS

The Federal Aviation Administration Civil Aviation Security Office which serves the place where the flight(s) will originate or which is responsible for the operators overall aviation security program.

NONCERTIFICATE HOLDING AIRCRAFT OPERATORS (OPERATIORS OPERATING UNDER FAR PART 91)

The Federal Aviation Administration Civil Aviation Security Office which serves the place where the flight(s) will originate. The nearest Civil Aviation Security Office may be located by calling the FAA Duty Officer, Day or Night, 202-426-3333.

MOTOR CARRIERS

Chief, Regulations Division, Bureau of Motor Carrier Safety, Federal Highway Administration, Department of Transportation, Washington, D.C. 20590. Day 202-426-1700 and Night 202-426-1830.

RAIL CARRIERS

Associate Administrator for Safety, Federal Railroad Administration, Department of Transportation, Washington, D.C. 20590. Day 202-426-0897 or 426-2748 and Night 202-426-1830.

WATER CARRIERS

Chief, Packaged Cargo Branch, Cargo and Hazardous Materials Divison, United States Coast Guard, Washington, D.C. 20590. Day or Night 202-426-1830.

[40 FR 48470, Oct. 15, 1975, as amended by Amdt. 107-1, 40 FR 56443, Dec. 3, 1975. Redesignated by Amdt. 107-4, 43 FR 43308, Sept. 25, 1978; Amdt. 107-7, 45 FR 32691, May 19, 1980]

APPENDIX B TO SUBPART B—STANDARD CONDITIONS APPLICABLE TO EXEMPTIONS

PACKAGES, CONTAINERS, SHIPMENTS

Exemptions from the regulations governing packages, containers, and the preparation and offering of hazardous materials for shipment are subject to the following conditions.

(1) The outside of each package must be plainly and durably marked "DOT-E" followed by the number assigned. On portable tanks, cargo tanks and tank cars, the markings must be in letters at least two inches high on a contracting background.

(2) Each shipping paper issued in connection with a shipment made under an exemption must, in association with the entries required by 49 CFR 172.203, bear the notation "DOT-E" followed by the number assigned.

(3) When an exemption issued to a shipper contains special carrier requirements, the shipper shall furnish a copy of the exemption to the carrier before or at the time a shipment is tendered.

FLIGHTS OF CARGO-ONLY AIRCRAFT

Exemptions from the regulations governing the transportation of hazardous materials on cargo-only aircraft are subject to the following conditions.

(1) No person other than a required flight crewmember, an FAA inspector, the shipper or consignee of the material or a representative of the shipper or consignee so designated in writing, or a person necessary for handling the material may be carried on the aircraft.

(2) The operator of the aircraft must have advance permission from the owner or operator of each manned airport where the material is to be loaded or unloaded or where the aircraft is to land while the material is on board.

(3) At any airport where the airport owner or operator or authorized representative thereof has designated a location for loading or unloading the material concerned, the material may not be loaded or unloaded at any other location.

(4) If the material concerned can create destructive forces or have lethal or injurious effects over an appreciable area as a result of an accident involving the aircraft or the material, the loading and unloading of the aircraft and its operation in takeoff, enroute, and in landing must be conducted at a safe distance from heavily populated areas and from any place of human abode or assembly.

(5) If the aircraft is being operating by a holder of a certificate issued under Part 121 or Part 135 of Title 14, CFR, operations must be conducted in accordance with conditions and limitations specified in the certificate holder's operations specifications or operations manual accepted by the FAA. If the aircraft is being operated under Part 91 of Title 14, CFR, operations must be conducted in accordance with an operations plan accepted and acknowledged in writing by the Civil Aviation Security Office responsible for the operator's overall aviation security program.

(6) Each crewmember of the aircraft must be provided written instructions on the conditions and limitations of the operation being conducted.

(7) The aircraft and the loading arrangement to be used must be approved for safe carriage of the particular materials concerned by the FAA Civil Aviation Security Office responsible for the operator's overall aviation security program or the FAA Civil Aviation Security Office serving the place where the material is to be loaded.

(8) When Class A explosives are carried aboard a cargo aircraft under the provisions of Subchapter C, the aircraft operator shall take all possible action to insure that routes over heavily populated areas are avoided commensurate with considerations of flight safety. During the approach and landing phase, the aircraft operator shall request appropriate vectors when under radar control to avoid heavily populated areas.

[40 FR 48470, Oct. 15, 1975, as amended by Amdt. 107-2, 41 FR 7509, Feb 19, 1976. Redesignated and amended by Amdt. 107-4, 43 FR 43308, Sept. 25, 1978; Amdt. 107-6, 45 FR 13090, Feb. 28, 1980; Amdt. 107-7, 45 FR 32591, May 19, 1980]

Subpart C—Preemption

SOURCE: Amdt. 107-3, 41 FR 38171, Sept. 9, 1976, unless otherwise noted.

EDITORIAL NOTE: Nomenclature changes to Subpart C appear at 48 FR 2651, Jan. 20, 1983 (Amdt. 107-11) and at 50 FR 45729, Nov. 1, 1985.

§ 107.201 Purpose and scope.

(a) This subpart prescribes procedures by which (1) a State or a political subdivision of a State having a requirement pertaining to the transportation of hazardous materials or any person affected by the requirement may obtain an administrative ruling as to whether the requirement is inconsistent with the Act or regulations issued under the Act, and (2) a State or a political subdivision of a State may obtain a determination as to whether a requirement of that State or political subdivision, which is inconsistent with the Act or regulations issued under the Act and therefore preempted by section 112(a) of the Act is not so preempted.

(b) For purposes of this subpart "political subdivision" includes a municipality; a public agency or other instrumentality of one or more States, municipalities, or other political subdivisions of a State; or a public corporation, board, or commission established under the laws of one or more States.

(c) For purposes of this subpart regulations issued under the Act means the regulations contained in this subchapter, Subchapter C of this chapter and 46 CFR Part 146.

(d) Unless otherwise ordered by the Director, OHMT, an application for an inconsistency ruling which includes an application for a determination that the requirement is not preempted will be treated and processed solely as an application for an inconsistency ruling.

(49 U.S.C. 1803, 1804, 1808, and 1809; 49 CFR 1.53, App. A to Part 1)

INCONSISTENCY RULINGS

§ 107.203 Application.

(a) Any State or political subdivision or any person affected by a requirement of a State or political subdivision may apply to the OHMT for an administrative ruling as to whether a particular existing requirement of the State or political subdivision concerned is inconsistent with a requirement of the Act or the regulations issued under the Act.

(b) Each application filed under this section for a ruling must:

(1) Be submitted to the Office of Hazardous Materials Transportation, Research and Special Programs Administration, U.S. Department of Transportation, Washington, D.C. 20590. Attention: Hazardous Materials Preemption Docket;

(2) Set forth the text of the State or political subdivision requirement for which the determination is being sought;

(3) Specify each requirement of the Act or the regulations issued under the Act with which the applicant seeks the State or political subdivision requirement to be compared for consistency; and

(4) State why the applicant believes the State or political subdivision requirement to be consistent or inconsistent with the requirements of the Act or the regulations issued under the Act.

(c) The filing of an application for a ruling under this section does not constitute grounds for noncompliance with any requirement of the Act or a regulation issued under the Act.

(49 U.S.C. 1803, 1804, 1808, and 1809; 49 CFR 1.53, App. A to Part 1)

§ 107.205 Notice.

(a) If the applicant is other than a State or political subdivision, the applicant shall mail a copy of the application to the State or political subdivision concerned accompanied by a statement that the State or political subdivision may submit comments regarding the application to the OHMT within 45 days. The application filed with the OHMT must include a certification that the applicant has complied with this paragraph and must include the names and addresses of each State or political subdivision official to whom a copy of the application was sent.

(b) The OHMT may by serving notice on any other persons readily identifiable by the OHMT as persons who will be affected by the ruling sought or by publication in the FEDERAL REGISTER afford those persons an opportunity to file written comments on the application.

(c) Each person submitting written comments to the OHMT with respect to an application filed under this section shall send a copy of the comments to the applicant and certify to the OHMT that he has complied with this requirement. The OHMT may notify other persons participating in the proceeding of the comments and provide an opportunity for those other persons to respond.

(49 U.S.C. 1803, 1804, 1808, and 1809; 49 CFR 1.53, App. A to Part 1)

[Amdt. 107-3, 41 FR 38171, Sept. 9, 1976, as amended by Amdt. 107-4, 43 FR 43308, Sept. 25, 1978; 43 FR 45366, Oct. 2, 1978; Amdt. 107-11, 48 FR 17094, Apr. 21, 1983]

§ 107.207 Processing.

(a) The Director, OHMT may initiate an investigation of any statement in an application and utilize in his evaluation any relevant facts obtained by that investigation. The Director, OHMT may solicit and accept submissions from third persons relevant to an application and will provide the applicant an opportunity to respond to all third person submissions. In evaluating an application, the Director, OHMT may consider any other source of information. The Director, OHMT, on his own initiative may convene a hearing or conference, if he considers that a hearing or conference will advance his evaluation of the application.

(b) The Director, OHMT may dismiss the application without prejudice if:

(1) He determines that there is insufficient information upon which to base a ruling; or

(2) He requests additional information from the applicant and it is not submitted.

(49 U.S.C. 1803, 1804, 1808, and 1809; 49 CFR 1.53, App. A to Part 1)

§ 107.209 Ruling.

(a) Upon consideration of the application and other relevant information received or obtained during the proceeding, the Director, OHMT, issues his ruling.

(b) Notwithstanding that application for a ruling has not been filed under § 107.203, the Director, OHMT, on his own initiative, may issue a ruling as to whether a particular State or political subdivision requirement is inconsistent with the Act or the regulations issued under the Act.

(c) In determining whether a State or political subdivision requirement is inconsistent with the Act or the regulations issued under the Act, the Director, OHMT considers:

(1) Whether compliance with both the State or political subdivision requirement and the Act or the regulations issued under the Act is possible; and

(2) The extent to which the State or political subdivision requirement is an obstacle to the accomplishment and execution of the Act and the regulations issued under the Act.

(d) The ruling includes a written statement setting forth the relevant facts and the legal basis for the ruling and provides that any person aggrieved thereby may file an appeal with the Administrator, RSPA.

(e) The OHMT serves a copy of the ruling upon the applicant, any other person who participated in the proceeding and upon any other person readily identifiable by the OHMT as one who is affected by the ruling. A copy of each ruling is placed on file in the public docket. The OHMT may publish the ruling or notice of the ruling in the FEDERAL REGISTER.

(f) A ruling issued under this section constitutes an administrative determination as to whether a particular requirement of a State or local subdivision is inconsistent with the Act or the regulations issued under the Act. The fact that a ruling has not been issued under this section with respect to a particular requirement of a State or political subdivision carries no implication as to the consistency or inconsistency of that requirement with the Act or any regulations issued under the Act.

(49 U.S.C. 1803, 1804, 1808, and 1809; 49 CFR 1.53, App. A to Part 1)

§ 107.211 Appeal.

Any person aggrieved by a ruling issued under § 107.209 may file an appeal with the Administrator, RSPA. The appeal must be filed within 30 days of service of the ruling. There has not been an exhaustion of administrative remedies until an appeal has been filed and the appellate process is completed by the issuance of an order by the Administrator, RSPA, granting or denying the appeal.

(49 U.S.C. 1803, 1804, 1808, and 1809; 49 CFR 1.53, App. A to Part 1)

NON-PREEMPTION DETERMINATIONS

§ 107.215 Application.

(a) Any State or political subdivision may apply to the OHMT for a determination that a particular existing requirement of that State or political subdivision which is inconsistent with the Act or the regulations issued under the Act is not preempted.

(b) Each application filed under this section for a nonpreemption determination must:

(1) Be submitted to the Office of Hazardous Materials Transportation, Research and Special Programs Administration, U.S. Department of Transportation, Washington, D.C. 20590. Attention: Hazardous Materials Preemption Docket;

(2) Set forth the text of the State or political subdivision requirement for which the determination is being sought;

(3) Include a copy of any court order and any ruling issued under § 107.209 having a bearing on the application;

(4) Contain an express acknowledgment by the applicant that the State or political subdivision requirement is inconsistent with one or more requirements of the Act or the regulations issued under the Act, unless it has been so determined by a court of competent jurisdiction or in a ruling issued under § 107.209;

(5) Specify each requirement of the Act or the regulations issued under the Act with which the State or political subdivision requirement is acknowledged or has been determined to be inconsistent;

(6) State why the applicant believes the State or political subdivision requirement affords an equal or greater level of protection to the public than is afforded by the requirements of the Act or the regulations issued under the Act;

(7) State why the applicant believes the State or political subdivision requirement does not unreasonably burden commerce; and

(8) Specify what steps the State or political subdivision is taking to administer and enforce effectively its inconsistent requirement.

§ 107.217 Notice.

(a) The applicant State or political subdivision shall mail a copy of the application and any subsequent amendments or other documents relating to the application to each person who is reasonably ascertainable by the applicant as a person who will be affected by the determination sought. The copy of the application must be accompanied by a statement that the person may submit comments regarding the application to the OHMT within 45 days. The application filed with the OHMT must include a certification that the application has complied with this paragraph and must include the names and addresses of each person to whom the application was sent.

(b) Notwithstanding the provisions of paragraph (a) of this section, if the State or political subdivision determines that compliance with paragraph (a) of this section would be impracticable, the applicant shall:

(1) Comply with the requirements of paragraph (a) of this section with regard to those persons whom it is reasonable and practicable to notify; and

(2) Include with the application filed with the OHMT a description of the persons or class or classes of persons to whom notice was not sent.

(c) The OHMT may require the State or political subdivision to provide notice in addition to that required by paragraphs (a) and (b) of this section, or may determine that the notice required by paragraph (a) of this section is not impracticable, or that notice should be published in the FEDERAL REGISTER.

(d) The OHMT may serve notice on any other persons readily identifiable by the OHMT as persons who will be affected by the determination sought and may afford those persons an opportunity to file written comments on the application.

(e) Any person submitting written comments to the OHMT with respect to an application filed under this section shall send a copy of the comments to the applicant. The person shall certify to the OHMT that he has complied with the requirements of this paragraph. The OHMT may notify other persons participating in the proceeding of the comments and provide an opportunity for those other persons to respond.

(49 U.S.C. 1803, 1804, 1808, and 1809; 49 CFR 1.53, App. A to Part 1)

§ 107.219 Processing.

(a) The Director, OHMT may initiate an investigation of any statement in an application and utilize in his evaluation any relevant facts obtained by that investigation. The Director, OHMT may solicit and accept submissions from third persons relevant to an application and will provide the applicant an opportunity to respond to all third person submissions. In evaluating an application, the Director, OHMT, on his own initiative may convene a hearing or conference, if he considers that a hearing or conference will advance his evaluation of the application.

(b) The Director, OHMT may dismiss the application without prejudice if:

(1) He determines that there is insufficient information upon which to base a determination;

(2) Upon his request, additional information is not submitted by the applicant; or

(3) The applicant fails to provide the notice required by § 107.217.

(c) Except as provided in § 107.201(c), the Director, OHMT will only consider an application for a non-preemption determination if:

(1) The applicant State or political subdivision expressly acknowledges in its application that the State or political subdivision requirement for which the determination is sought is inconsistent with the requirements of the Act or the regulations issued under the Act; or

(2) The State or political subdivision requirement has been determined by a court of competent jurisdiction or in a ruling issued under § 107.209 to be inconsistent with the requirements of the Act or the regulations issued under the Act.

(d) When the OHMT has received all substantive information it considers necessary to process an application for a non-preemption determination, it serves notice of that fact upon the applicant and all other persons who received notice of the proceeding pursuant to § 107.217.

(e) To the extent possible, each application for a non-preemption determination will be acted upon in a manner consistent with the disposition of previous applications for non-preemption determinations.

(49 U.S.C. 1803, 1804, 1808, and 1809; 49 CFR 1.53, App. A to Part 1)

§ 107.221 Determination and order.

(a) Upon consideration of the application and other relevant information received or obtained during the proceeding, the Director, OHMT issues an order setting forth his determination.

(b) The Director, OHMT may issue a non-preemption order only if he finds that the State or political subdivision requirement affords to the public a level of safety at least equal to that afforded by the requirements of the Act and the regulations issued under the Act and does not unreasonably burden commerce. In determining whether the State or political subdivision requirement unreasonably burdens commerce, the Director, OHMT considers the following factors:

(1) The extent to which increased costs and impairment of efficiency result from the State or political subdivision requirement.

(2) Whether the State or political subdivision requirement has a rational basis.

(3) Whether the State or political subdivision requirement achieves its stated purpose.

(4) Whether there is need for uniformity with regard to the subject concerned and if so, whether the State or political subdivision requirement competes or conflicts with those of other States and political subdivisions.

(c) The order includes a written statement setting forth the relevant facts and the legal basis for the determination. The order provides that any person aggrieved thereby may file an appeal with the Administrator, RSPA.

(d) The OHMT serves a copy of the order upon the applicant, any other person who participated in the proceeding and upon any other person readily identifiable by the OHMT as one who is affected by the order. A copy of each order is placed on file in the public docket. The Director, OHMT may publish the order or notice of the order in the FEDERAL REGISTER.

(e) An order issued under this section constitutes an administrative determination as to whether a particular requirement of a State or local subdivision of a State, which is inconsistent with the requirements of the Act or the regulations issued under the Act is not preempted.

(49 U.S.C. 1803, 1804, 1808, and 1809; 49 CFR 1.53, App. A to Part 1)

§ 107.223 Timeliness.

If the OHMT fails to take action on the application within 90 days of serving the notice required by § 107.219(d), the applicant may treat the application as having been denied in all respects and may appeal therefrom as provided in § 107.225.

(49 U.S.C. 1803, 1804, 1808, and 1809; 49 CFR 1.53, App. A to Part 1)

§ 107.225 Appeal.

Any person aggrieved by an order issued under § 107.221 may file an appeal with the Administrator, RSPA. The appeal must be filed within 30 days of service of the order. There has not been an exhaustion of administrative remedies until an appeal has been filed and the appellate process is completed by the issuance of an order by the Administrator, RSPA, granting or denying the appeal.

(49 U.S.C. 1803, 1804, 1808, and 1809; 49 CFR 1.53, App. A to Part 1)

Subpart D—Enforcement

AUTHORITY: 49 U.S.C. 1803, 1804, 1808, and 1809; 49 CFR 1.53, App. A to Part 1.

SOURCE: Amdt. 107-11, 48 FR 2651, Jan. 20, 1983, unless otherwise noted.

§ 107.299 Definitions.

In this subpart, and in enforcement actions initiated thereunder,

"Investigation" includes investigations authorized under 49 U.S.C. 1809(a) and inspections authorized under 49 U.S.C. 1809(c).

"Knowledge" or "knowingly" means that a person who commits an act which is a violation of the Act or of the requirements of this subchapter or Subchapter C of this chapter commits that act with knowledge or knowingly when that person (1) has actual knowledge of the facts that give rise to the violation, or (2) should have known of the facts that give rise to the violation. A person knowingly commits an act if the act is done voluntarily and intentionally. Knowledge or knowingly means that a person is presumed to be aware of the requirements of the Act and this subchapter and Subchapter C of this chapter. Knowledge or knowingly does not require that a person have an intent to violate the requirements of the Act or the requirements of this subchapter or Subchapter C of this chapter.

§ 107.301 Delegated authority for enforcement.

Under redelegation from the Administrator, Research and Special Programs Administration, the OHMT and the Office of the Chief Counsel exercise their authority for enforcement of the Act, this subchapter, and Subchapter C of this subchapter, in accordance with § 1.53 of this title.

§ 107.303 Purpose and scope.

This subchapter describes the various enforcement authorities exercised by the OHMT and the associated sanctions and prescribes the procedures governing the exercise of those authorities and the imposition of those sanctions.

§ 107.305 Investigations.

(a) *General.* In accordance with its delegated authority under Part 1 of this title, the OHMT may initiate investigations relating to compliance by any person with any provisions of this subchapter or Subchapter C of this chapter, or any exemption, approval, or order issued thereunder, or any court decree relating thereto. The OHMT encourages voluntary production of documents in accordance with and subject to § 107.13, and hearings may be conducted, and depositions taken pursuant to section 109(a) of the Act. The OHMT may conduct investigative conferences and hearings in the course of any investigation.

(b) *Investigators.* Investigations under Section 109(a) of the Act are conducted by OHMT personnel duly authorized for that purpose by the Director, OHMT. Inspections under Section 109(b) of the Act, are conducted by OHMT Hazardous Materials Enforcement Specialists who are duly designated for that purpose. Each official so designated may administer oaths and receive affirmations in any matter under investigation by the OHMT.

(c) *Notification.* Any person who is the subject of an OHMT investigation and who is requested to furnish information or documentary evidence is notified as to the general purpose for which the information or evidence is sought.

(d) *Termination.* When the facts disclosed by an investigation indicate that further action is unnecessary or unwarranted at that time, the person being investigated is notified and the investigative file is closed without prejudice to further investigation by the OHMT.

(e) *Confidentiality.* Information received in an investigation under this section, including the identity of the person investigated and any other person who provides information during the investigation, shall remain confidential under the investigatory file exception, or other appropriate exception, to the public disclosure requirements of 5 U.S.C. 552.

COMPLIANCE ORDERS AND CIVIL PENALTIES

§ 107.307 General.

(a) When the Office of Chief Counsel has reason to believe that a person is knowingly engaging or has knowingly engaged in conduct which is a violation of the Act or any provision of this subchapter or Subchapter C of this chapter, or any exemption, or order issued thereunder, for which the Office of Chief Counsel exercises enforcement responsibility, and if time, the nature of the violation, and the public interest permit, the Office of Chief Counsel may conduct proceedings to assess a civil penalty or to issue an order directing compliance, or both, or seek any other remedy available under the Act.

(b) In the case of a proceeding initiated for failure to comply with an exemption, the allegation of a violation of a term or condition thereof is considered by the Office of Chief Counsel to constitute an allegation that the exemption holder or party to the exemption is failing, or has failed to comply with the underlying regulations from which relief was granted by the exemption.

§ 107.309 Warning letters.

(a) In addition to the initiation of proceedings under § 107.307 for the imposition of sanctions or other remedies, the Office of Chief Counsel may issue a warning letter to any person whom the Office of Chief Counsel believes to have committed a probable violation of the Act or any provision of this subchapter, Subchapter C of this chapter, or any exemption issued thereunder.

(b) A warning letter issued under this section includes:

(1) A statement of the facts upon which the Office of Chief Counsel bases its determination that the person has committed a probable violation;

(2) A statement that the recurrence of the probable violations cited may subject the person to enforcement action; and

(3) An opportunity to respond to the warning letter by submitting pertinent information or explanations concerning the probable violations cited therein.

§ 107.311 Notice of probable violation.

(a) The Office of Chief Counsel begins an enforcement action under

§ 107.307, by serving a notice of probable violation on a person alleging the violation of one or more provisions of the Act, this subchapter, or Subchapter C of this chapter, or any exemption issued thereunder.

(b) A notice of probable violation issued under this section includes the following information:

(1) A citation of the provisions of the Act, this subchapter, Subchapter C of this chapter, or the terms of any exemption issued thereunder which the Office of Chief Counsel believes the respondent is violating or has violated.

(2) A statement of the factual allegations upon which the demand for remedial action, a civil penalty, or both, is based.

(3) A statement of the respondent's right to present written or oral explanations, information, and arguments in answer to the allegations and in mitigation of the sanction sought in the notice of probable violation.

(4) A statement of the respondent's right to request a hearing and the procedures for requesting a hearing.

(5) In addition, in the case of a notice of probable violation proposing a compliance order, a statement of the proposed actions to be taken by the respondent to achieve compliance.

(6) In addition, in the case of a notice of probable violation proposing a civil penalty:

(i) A statement of the maximum civil penalty for which the respondent may be liable;

(ii) The amount of the preliminary civil penalty being sought by the Office of Chief Counsel, constitutes the maximum amount the Chief Counsel may seek throughout the proceeding; and

(iii) A description of the manner in which the respondent makes payment of any money due the United States as a result of the proceeding.

(c) The Office of Chief Counsel may amend a notice of probable violation at any time before issuance of a compliance order or an order assessing a civil penalty. If Office of Chief Counsel alleges any new material facts or seeks new or additional remedial action or an increase in the amount of the proposed civil penalty, it issues a new notice of probable violation under this section.

[Amdt. 107-11, 48 FR 2651, Jan. 20, 1983, as amended at 50 FR 45730, Nov. 1, 1985]

§ 107.313 Reply.

(a) Within 30 days of receipt of a notice of probable violation, the respondent must either:

(1) Admit the violation under § 107.315;

(2) Make an informal response under § 107.317; or

(3) Request a hearing under § 107.319.

(b) Failure of the respondent to file a reply as provided in this section constitutes a waiver of the respondent's right to appear and contest the allegations and authorizes the Chief Counsel, without further notice to the respondent, to find the facts to be as alleged in the notice of probable violation and issue an order directing compliance or assess a civil penalty, or, if proposed in the notice, both. Failure to request a hearing under paragraph (a)(3) of this section constitutes a waiver of the respondent's right to a hearing.

(c) Upon the request of the respondent, the Office of Chief Counsel may, for good cause shown and filed within the 30 days prescribed in the notice of probable violation, extend the 30-day response period.

§ 107.315 Admission of violations.

(a) In responding to a notice of probable violation issued under § 107.311, the respondent may admit the alleged violations and agree to accept the terms of a proposed compliance order or to pay the amount of the preliminarily assessed civil penalty, or, if proposed in the notice, both.

(b) If the respondent agrees to the terms of a proposed compliance order, the Chief Counsel issues a final order prescribing the remedial action to be taken by the respondent.

(c) Payment of a civil penalty must be made by certified check or money order payable to the Treasurer of the United States and sent to the Chief Counsel, Research and Special Programs Administration, 400 Seventh

Street, S.W., Room 8420, Washington, D.C. 20590.

§ 107.317 Informal response.

(a) In responding to a notice of probable violation under § 107.311, the respondent may submit to the official who issued the notice, written explanations, information, or arguments in response to the allegations, the terms of a proposed compliance order, or the amount of the preliminarily assessed civil penalty.

(b) The respondent may include in his informal response a request for a conference. Upon the request of the respondent, the conference may be either in person or by telephone. A request for a conference must set forth the issues the respondent will raise at the conference.

(c) Upon receipt of a request for a conference under paragraph (b) of this section, the Chief Counsel's Office, in consultation with the OHMT, arranges for a conference as soon as practicable at a time and place of mutual convenience.

(d) The respondent's written explanations, information, and arguments as well as the respondent's presentation at a conference are considered by the Chief Counsel in reviewing the notice of probable violation. Based upon a review of the proceeding, the Chief Counsel may dismiss the notice of probable violation in whole or in part. If he does not dismiss it in whole, he issues an order directing compliance or assessing a civil penalty, or, if proposed in the notice, both.

§ 107.319 Request for a hearing.

(a) In responding to a notice of probable violation under § 107.311, the respondent may request a formal administrative hearing on the record before an Administrative Law Judge (ALJ) obtained by the Office of the Chief Counsel.

(b) A request for a hearing under paragraph (a) of this section must:

(1) State the name and address of the respondent and of the person submitting the request if different from the respondent;

(2) State which allegations of violations, if any, are admitted; and

(3) State generally the issues to be raised by the respondent at the hearing. Issues not raised in the request are not barred from presentation at the hearing; and

(4) Be addressed to the official who issued the notice.

(c) After a request for a hearing that complies with the requirements of paragraph (b) of this section, the Chief Counsel obtains an ALJ to preside over the hearing and notifies the respondent of this fact. Upon assignment of an ALJ. all further matters in the proceeding are conducted by and through the ALJ.

[Amdt. 107-11, 48 FR 2651, Jan. 20, 1983, as amended at 48 FR 17094, Apr. 21, 1983]

§ 107.321 Hearing.

(a) To the extent practicable, the hearing is held in the general vicinity of the place where the alleged violation occurred or at a place convenient to the respondent. Testimony by witnesses shall be given under oath and the hearing shall be recorded verbatim.

(b) Hearings are conducted in accordance with the Federal Rules of Evidence and Federal Rules of Civil Procedure; however, the ALJ may modify them as he determines necessary in the interest of a full development of the facts. In addition, the ALJ may:

(1) Administer oaths and affirmations;

(2) Issue subpoenas as provided by § 107.13;

(3) Adopt procedures for the submission of motions, evidence, and other documents pertinent to the proceeding;

(4) Take or cause depositions to be taken;

(5) Rule on offers of proof and receive relevant evidence;

(6) Examine witnesses at the hearing;

(7) Convene, recess, reconvene, adjourn and otherwise regulate the course of the hearing;

(8) Hold conferences for settlement, simplification of the issues, or any other proper purpose; and

(9) Take any other action authorized by, or consistent with, the provisions

of this subpart and permitted by law which may expedite the hearing or aid in the disposition of an issue raised therein.

(c) The official who issued the notice of probable violation, or his representative, has the burden of proving the facts alleged therein.

(d) The respondent may appear and be heard on his own behalf or through counsel of his choice. The respondent or his counsel may offer relevant information including testimony which he believes should be considered in opposition to the allegations or which may bear on the sanction being sought and conduct such cross-examination as may be required for a full disclosure of the facts.

§ 107.323 ALJ's decision.

(a) After consideration of all matters of record in the proceeding, the ALJ shall issue an order dismissing the notice of probable violation in whole or in part or granting the sanction sought by the Office of Chief Counsel in the notice. If the ALJ does not dismiss the notice of probable violation in whole, he issues an order directing compliance or assessing a civil penalty, or, if proposed in the notice, both. The order includes a statement of the findings and conclusions, and the reasons therefore, on all material issues of fact, law, and discretion.

(b) If, within 20 days of receipt of an order issued under paragraph (a) of this section, the respondent does not submit in writing his acceptance of the terms of an order directing compliance, or, where appropriate, pay a civil penalty, or file an appeal under § 107.325, the case may be referred to the Attorney General with a request that an action be brought in the appropriate United States District Court to enforce the terms of a compliance order or collect the civil penalty.

§ 107.325 Appeals.

(a) *Hearing proceedings.* A party aggrieved by an ALJ's decision and order issued under § 107.323, may file a written appeal in accordance with paragraph (c) of this section with the Administrator, Research and Special Programs Administration (RSPA), 400 Seventh Street, S.W., Washington, D.C. 20590.

(b) *Non-Hearing proceedings.* A respondent aggrieved by an order issued under § 107.317, may file a written appeal in accordance with paragraph (c) of this section with the Administrator, RSPA, 400 Seventh Street, S.W., Washington, D.C. 20590.

(c) An appeal of an order issued under this subpart must:

(1) Be filed within 20 days of receipt of the order by the appealing party; and

(2) State with particularity the findings in the order that the appealing party challenges, and include all information and arguments pertinent thereto.

(d) If the Administrator, RSPA, affirms the order in whole or in part, the respondent must comply with the terms of the decision within 20 days of the respondent's receipt thereof, or within the time prescribed in the order. If the respondent does not comply with the terms of the decision within 20 days of receipt, or within the time prescribed in the order, the case may be referred to the Attorney General for action to enforce the terms of the decision.

(e) The filing of an appeal stays the effectiveness of an order issued under § 107.317 or § 107.323. However, if the Administrator, RSPA, determines that it is in the public interest, he may keep an order directing compliance in force pending appeal.

[Amdt. 107-11, 48 FR 2651, Jan. 20, 1983, as amended at 50 FR 45730, Nov. 1, 1985]

§ 107.327 Compromise and settlement.

(a) At any time before an order issued under § 107.317 or § 107.323 is referred to the Attorney General for enforcement, the respondent or the Office of Chief Counsel may propose a compromise as follows:

(1) In civil penalty cases, the respondent or Chief Counsel may offer to compromise the amount of the penalty by submitting an offer for a specific amount to the other party. An offer of compromise by the respondent shall be submitted to the Chief Counsel who may, after consultation with OHMT, accept or reject it.

(i) A compromise offer stays the running of any response period then outstanding.

(ii) If a compromise is agreed to by the parties, the respondent is notified in writing. Upon receipt of payment by Office of Chief Counsel, the respondent is notified in writing that acceptance of payment is in full satisfaction of the civil penalty proposed or assessed, and Office of Chief Counsel closes the case with prejudice to the respondent.

(iii) If a compromise cannot be agreed to, the respondent is notified in writting and is given 10 days or the amount of time remaining in the then outstanding response period, whichever is longer, to respond to whatever action was taken by the Office of Chief Counsel or the Administrator, RSPA.

(2) In compliance order cases, the respondent may propose a consent agreement to the Chief Counsel. If the Chief Counsel accepts the agreement, he issues an order in accordance with its terms. If the Chief Counsel rejects the agreement, he directs that the proceeding continue. An agreement submitted to the Chief Counsel must include:

(i) A statement of any allegations of fact which the respondent challenges;

(ii) The reasons why the terms of a compliance order or proposed compliance order are or would be too burdensome for the respondent, or why such terms are not supported by the record in the case;

(iii) A proposed compliance order suitable for issuance by the Chief Counsel;

(iv) An admission of all jurisdictional facts; and

(v) An express waiver of further procedural steps and all right to seek judicial review or otherwise challenge or contest the validity of the order.

(b) Notwithstanding paragraph (a)(1) of this section, the respondent or Office of Chief Counsel may propose to settle the case. If the Chief Counsel agrees to a settlement, the respondent is notified and the case is closed without prejudice to the respondent.

[Amdt. 107-11, 48 FR 2651, Jan. 20, 1983, as amended at 50 FR 45730, Nov. 1, 1985]

§ 107.329 Maximum penalties.

(a) A person who knowingly violates a requirement of the Act, this chapter or an exemption issued under Subchapter B of this chapter applicable to the transporting of hazardous materials or the causing of them to be transported or shipped is liable for a civil penalty of not more than $10,000 for each violation. When the violation is a continuing one, each day of the violation constitutes a separate offense.

(b) A person who knowingly violates a requirement of the Act, this chapter or an exemption issued under Subchapter B of this Chapter applicable to the manufacture, fabrication, marking, maintenance, reconditioning, repair, or testing of a packaging or container which is represented, marked, certified or sold by that person as being qualified for use in the transportation of hazardous materials in commerce is liable for a civil penalty of not more than $10,000 for each violation.

§ 107.331 Assessment considerations.

In assessing a civil penalty under this subpart, the Chief Counsel takes into account:

(a) The nature and circumstances of the violation;

(b) The extent and gravity of the violation;

(c) The degree of the respondent's culpability;

(d) The respondent's history of prior offenses;

(e) The respondent's ability to pay;

(f) The effect on the respondent's ability to continue in business; and

(g) Such other matters as justice may require.

CRIMINAL PENALTIES

§ 107.333 Criminal penalties generally.

Section 110(b) of the Act (49 U.S.C. 1809(b)) provides a criminal penalty of a fine of not more than $25,000 and imprisonment for not more than five years, or both, for any person who willfully violates a provision of the Act or a regulation issued under the Act.

§ 107.335 Referral for prosecution.

If the OHMT becomes aware of a possible willful violation of the Act, this chapter, Subchapter C of this chapter, or any exemption, or order issued thereunder, for which the OHMT exercises enforcement responsibility, it shall report it to the Office of the Chief Counsel, Research and Special Programs Administration, U.S. Department of Transportation, Washington, D.C. 20590. If appropriate, the Chief Counsel refers the report to the Department of Justice for criminal prosecution of the offender.

INJUNCTIVE ACTION

§ 107.337 Injunctions generally.

Whenever it appears to the Office of Chief Counsel that a person has engaged, or is engaged, or is about to engage in any act or practice constituting a violation of any provision of the Act, this subchapter, Subchapter C of this chapter, or any exemption, or order issued thereunder, for which the Office of Chief Counsel exercises enforcement responsibility, the Administrator, RSPA, or his delegate, may request the Attorney General to bring an action in the appropriate United States District Court for such relief as is necessary or appropriate, including mandatory or prohibitive injunctive relief, interim equitable relief, and punitive damages as provided by section 111(a) of the Act.

§ 107.339 Imminent hazards.

Whenever it appears to the OHMT that there is a substantial likelihood that death, serious illness, or severe personal injury will result from the transportation of a particular hazardous material or hazardous materials container, before a compliance order proceeding or other administrative hearing or formal proceeding to abate the risk of that harm can be completed, the Administrator, RSPA, or his delegate, may bring an action under section 111(b) of the Act in the appropriate United States District Court for an order suspending or restricting the transporation of that hazardous material or those containers or for such other equitable relief as is necessary or appropriate to ameliorate the hazard.

Subpart E—Designation of Approval and Certification Agencies

AUTHORITY: 49 U.S.C. 1804, 1805, 1808; 49 CFR 1.53; App. A to Part 1.

SOURCE: Amdt. 107-13, 50 FR 10062, Mar. 13, 1985, unless otherwise noted.

§ 107.401 Purpose and scope.

(a) This subpart establishes procedures for the designation of agencies to issue approval certificates and certifications for types of packagings designed, manufactured, tested, or maintained in conformance with the requirements of this subchapter, Subchapter C of this chapter, and standards set forth in the United Nations (U.N.) Recommendations (Transport of Dangerous Goods). Except for certifications of compliance with U.N. packaging standards, this subpart does not apply unless made applicable by a rule in Subchapter C of this chapter.

(b) The Director, OHMT may issue approval certificates and certifications addressed in paragraph (a) of this section.

§ 107.402 Application for designation as an approval or certification agency.

(a) Any organization or person seeking designation as an approval or certification agency shall apply in writing to the Director, Office of Hazardous Materials Transportation (DMT-20), Department of Transportation, 400 Seventh Street, SW., Washington D.C. 20590. Each application must be signed and certified to be correct by the applicant or, if the applicant is an organization, by an authorized officer or official representative of the organization. Any false statement or representation, or the knowing and willful concealment of a material fact, may subject the applicant to prosecution under the provisions of 18 U.S.C. 1001, result in the denial or termination of a designation.

(b) Each application for designation must be in English and include the following information:

(1) Name and address of the applicant, including place of incorporation

if a corporation. In addition, if the applicant is not a resident of the United States, the name and address of a permanent resident of the United States designated in accordance with § 107.7 to serve as agent for service of process.

(2) If the applicant's principal place of business is in a country other than the United States, a copy of the designation from the Competent Authority of that country delegating to the applicant an approval or designated agency authority for the type of packaging for which a DOT designation is sought, and a statement that the Competent Authority also delegates similar authority to U.S. Citizens or organizations having designations under this subpart from the RSPA.

(3) A listing, by DOT specification (or exemption) number, or UN designation, of the types of packagings for which approval authority is sought.

(4) A personnel qualifications plan listing the qualifications that the applicant will require of each person to be used in the performance of each packaging approval or certification function. As a minimum, these qualifications must include:

(i) The ability to review and evaluate design drawings, design and stress calculations;

(ii) A knowledge of the applicable regulations of Subchapter C of this chapter and, when applicable, U.N. standards; and

(iii) The ability to conduct or monitor and evaluate test procedures and results; and

(iv) The ability to review and evaluate the qualifications of materials and fabrication procedures.

(5) A statement that the applicant will perform its functions independent of the manufacturers and owners of the packagings concerned.

(6) A statement that the applicant will allow the Director, OHMT or his representative to inspect its records and facilities in so far as they relate to the approval or certification of specification packagings and shall cooperate in the conduct of such inspections.

(c) The applicant shall furnish any additional information relevant to the applicant's qualifications, if requested by the Director, OHMT.

[Amdt. 107-13, 50 FR 10062, Mar. 13, 1985; 50 FR 16089, Apr. 24, 1985]

§ 107.403 Designation of approval agencies.

(a) If the Director, OHMT determines that an application contains all the required information, the applicant is sent a letter of designation and assigned an identification code.

(b) If the Director, OHMT determines that an application does not contain all the required information, the application is denied and the applicant is sent a written notice containing all the reasons for the denial.

(c) Within 30 days of an initial denial of an application under paragraph (b) of this section, the applicant may file an amended application. If after considering the amended application, the Director determines that it should be denied, he notifies the applicant, and the denial constitutes the final action of the Director on the application. Within 60 days of receipt of the final denial the applicant may appeal the denial to the Administrator, RSPA, setting forth in writing where the Director erred in this determination.

§ 107.404 Conditions of designation.

(a) Each designation made under this subpart contains the following conditions:

(1) The designated approval or certification agency may use only testing equipment that it has determined, through personal inspection, to be suitable for the purpose.

(2) Each approval certificate and certification issued by the designated approval agency must contain the name and identification code of the approval agency.

(3) Each approval certificate and certification must be in a format acceptable to the Director, OHMT.

(b) The designated approval agency shall notify the Director, OHMT within 20 days after the date there is any change in the information submitted under § 107.402.

(c) The designated approval agency shall comply with all of the terms and conditions stated in its letter of designation under the subpart.

(d) Nothing in this part relieves a manufacturer or owner of a packaging of responsibility for compliance with any of the applicable requirements of this title.

§ 107.405 Termination of designation.

(a) Any designation issued under § 107.403 of this subchapter may be suspended or terminated if the Director, OHMT determines that:

(1) The application for designation contained a misrepresentation, or the applicant willfully concealed a material fact.

(2) The approval agency failed to comply with a term or condition stated in the agency's letter of designation.

(3) The Competent Authority of an approval agency of a country outside the United States has failed to initiate, maintain or recognize a qualified U.S. approval agency.

(b) Before a designation is suspended or terminated, the Director, OHMT shall give to the approval agency:

(1) Written notice of the facts or conduct believed to warrant suspension or termination of the designation.

(2) Sixty days in which to show in writing why the designation should not be suspended or terminated.

SUBCHAPTER C—HAZARDOUS MATERIALS REGULATIONS

PART 171—GENERAL INFORMATION, REGULATIONS, AND DEFINITIONS

Sec.

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171.20 Submission of Examination Reports.

AUTHORITY: 49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53(e), unless otherwise noted.

EDITORIAL NOTE: Nomenclature changes to Part 171 appear at 50 FR 45730–45731, Nov. 1, 1985.

§ 171.1 Purpose and scope.

This subchapter prescribes the requirements of the Department of Transportation governing:

(a) The transportation of hazardous materials by, and their offering to:

(1) Carriers by rail car, aircraft and vessel (except as delegated at § 1.46(t) of this title);

(2) Interstate and foreign carriers by motor vehicle; and

(3) Intrastate carriers by motor vehicle so far as this subchapter relates to:

(i) Hazardous waste.

(ii) Hazardous substances.

(iii) Flammable cryogenic liquids in portable tanks and cargo tanks.

(b) The manufacture, fabrication, marking, maintenance, reconditioning, repairing, or testing of a packaging or container which is represented, marked, certified, or sold for use in such transportation as specified in paragraph (a) of this section.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 171-53, 45 FR 34586, May 22, 1980, as amended by Amdt. 171-74, 48 FR 27690, June 16, 1983; Amdt. 171-78, 49 FR 10510, Mar. 20, 1984]

§ 171.2 General requirements.

(a) No person may offer or accept a hazardous material for transportation in commerce unless that material is properly classed, described, packaged, marked, labeled, and in condition for shipment as required or authorized by this subchapter (including §§ 171.11, 171.12, and 176.11), or

(b) No person may transport a hazardous material in commerce unless that material is handled and transported in accordance with this subchapter, or an exemption issued under Subchapter B of this chapter.

(c) No person may represent, mark, certify, sell, or offer a packaging or container as meeting the requirements of this subchapter or an exemption issued under Subchapter B of this chapter, governing its use in the transportation in commerce of a hazardous material, whether or not it is used or intended to be used for the transportation of a hazardous material, unless the packaging or container is manufactured, fabricated, marked, maintained, reconditioned, repaired, or retested, as appropriate, in accordance with this subchapter, an approval issued thereunder, or an exemption issued under Subchapter B of this chapter.

(d) The representations, markings, and certifications subject to the prohibitions of paragraph (c) of this section include:

(1) Specification identifications that include the letters "DOT" or "UN";

(2) Exemption, approval, and registration numbers that include the letters "DOT;" and

(3) Test dates displayed in association with specification, registration, approval, or exemption markings indicating compliance with a test or retest requirement of this subchapter, an approval issued thereunder, or an exemption issued under Subchapter B of this chapter.

(49 U.S.C. 1803, 1804, 1808, and 1809; 49 CFR 1.53, App. A to Part 1)

[Amdt. 171-70, 48 FR 2655, Jan. 20, 1983]

§ 171.3 Hazardous waste.

(a) No person may offer for transportation or transport a hazardous waste (as defined in § 171.8 of this subchapter) in interstate or intrastate commerce except in accordance with the requirements of this subchapter.

(b) No person may accept for transportation, transport, or deliver a hazardous waste for which a manifest is required unless that person:

(1) Has marked each motor vehicle used to transport hazardous waste in accordance with § 397.21 or § 1058.2 of this title even though placards may not be required;

(2) Complies with the requirements for manifests set forth in § 172.205 of this subchapter; and

(3) Delivers, as designated on the manifest by the generator, the entire quantity of the waste received from the generator or a transporter to:

(i) The designated facility or, if not possible, to the designated alternate facility;

(ii) The designated subsequent carrier; or

(iii) A designated place outside the United States.

NOTE: Federal law specifies penalties up to $25,000 fine and 5 years imprisonment for the willful discharge of hazardous waste at other than designated facilities. 49 U.S.C. 1809.

(c) With regard to hazardous waste subject to this subchapter, any requirement of a state or its political subdivision is inconsistent with this subchapter if it applies because that material is a waste material and applies differently from or in addition to the requirements of this subchapter concerning:

(1) Packaging, marking, labeling, or placarding;

(2) Format or contents of discharge reports (except immediate reports for emergency response); and

(3) Format or contents of shipping papers, including hazardous waste manifests.

NOTE: See § 172.205; each manifest must be prepared in accordance with 40 CFR 262.20 including the instructions and limitations specified for preparation of a manifest.

(d) If a discharge of hazardous waste or other hazardous material occurs during transportation, and an official of a State or local government or a Federal agency, acting within the scope of his official responsibilities, determines that immediate removal of the waste is necessary to prevent further consequence, that official may authorize the removal of the waste without the preparation of a manifest. [NOTE: In such cases, EPA does not require carriers to have EPA identification numbers.]

(e) If a hazardous material that is a hazardous waste is required by this subchapter to be shipped in a closed head DOT specification drum, and the hazardous waste contains solids or semisolids that would make its placement in a closed head drum impracticable (e.g., a drum with a 2.3 inch bung opening), an equivalent specification open head drum (except for closure) may be used for such a waste.

NOTE 1: EPA requires shippers (generators) and carriers (transporters) of hazardous wastes to have identification numbers which must be displayed on hazardous waste manifests. See 40 CFR 262.20(a) and 263.11. (Identification number application forms (EPA Form 8700-12) may be obtained from EPA Regional Offices.)

NOTE 2: The following EPA regulation is set forth in 40 CFR Part 263:

§ 263.31 Discharge clean up

A transporter must clean up any hazardous waste discharge that occurs during transportation or take such action as may be required or approved by Federal, State, or local officials so that the hazardous waste discharge no longer presents a hazard to human health or the environment.

[Amdt. 171-53, 45 FR 34586, May 22, 1980, as amended by Amdt. 171-53, 45 FR 74648, Nov. 10, 1980; Amdt. 171-78, 49 FR 10510, Mar. 20, 1984]

§ 171.4 Changes in specifications for tank cars.

(a) See § 179.4 of this subchapter.

[31 FR 9068, July 1, 1966. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 171-42, 43 FR 48643, Oct. 19, 1978]

§ 171.5 Procedure covering tank car construction.

(a) See § 179.3 of this subchapter.

[Order 71, 31 FR 9068, July 1, 1966. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 171-42, 43 FR 48643, Oct. 19, 1978]

§ 171.6 [Reserved]

§ 171.7 Matter incorporated by reference.

(a) There is incorporated by reference in Parts 170-189 of this subchapter all matter referred to that is not specifically set forth. These materials are hereby made a part of the regulations in Parts 170-189 of this subchapter. Unless the reference provides otherwise, matter subject to change is incorporated only as it is in effect on the date of issuance of the regulation referring to that matter.

(b) All incorporated matter is available for inspection in the Dockets Branch, Room 8426 Nassif Building, 400 7th Street SW., Washington, D.C. 20590.

(c) Matter incorporated by reference is available for distribution as follows:

(1) ASME: American Society of Mechanical Engineers, United Engineering Center, 345 East 47th Street, New York, N.Y. 10017.

(2) American National Standard: American National Standards Institute, Inc., 1430 Broadway, New York, N.Y. 10018.

(3) CGA: Compressed Gas Association, Inc., 1235 Jefferson Davis Highway, Arlington, Virginia 22202.

(4) Bureau of Explosives: Bureau of Explosives, Association of American Railroads, American Railroads Building, 1920 L Street NW., Washington, D.C. 20036.

(5) AAR: Association of American Railroads, 59 East Van Buren Street, Chicago, Ill. 60605.

(6) ASTM: American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pa. 19103.

(7) API: American Petroleum Institute, 1801 K Street, NW., Washington, D.C. 20037.

(8) AISI: American Iron and Steel Institute, 1000 16th Street NW., Washington, D.C. 20036.

(9) The Chlorine Institute, 342 Madison Avenue, New York, N.Y. 10017.

(10) CMA: Chemical Manufacturers Association, 2501 M Street, NW., Washington, D.C. 20037

(11) NFPA: National Fire Protection Association, Batterymarch Park, Quincy, Mass. 02269.

(12) Aluminum Association: The Aluminum Association, 818 Connecticut Ave., NW., Washington, D.C. 20006.

(13) NACE: National Association of Corrosion Engineers, 1440 South Creek, Houston, Texas 77084.

(14) IME: Institute of Makers of Explosives, 1575 Eye Street, NW., Washington, D.C. 20005.

(15) IAEA: International Atomic Energy Agency, Wagramerstrasse 5, P.O. Box 100, A-1400, Vienna, Austria (IAEA publications may be purchased in the United States from: Unipub, Inc., Post Office Box 433, New York, NY 10016).

(16) USDOE: United States Department of Energy, Washington, D.C. 20545. Regulations of the USDOE are available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Other publications by the USDOE may be obtained from the National Technical Information Center, U.S. Department of Commerce, Springfield, Virginia 22151.

(17) Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

(18) National Wooden Box Association, Post Office Box 1010, Cumberland, Md. 21502.

(19) TFI: The Fertilizer Institute, 1015 18th Street NW., Washington, D.C. 20036.

(20) AWWA: American Water Works Association, 1010 Vermont Ave., NW., Washington, D.C. 20005.

(21) AWS: American Welding Society, 345 East 47th Street, New York, NY 10016.

(22) USDC: U.S. Department of Commerce, National Technical Infor-

mation Service, 5285 Port Royal Road, Springfield, Va. 22151.

(23) International Maritime Organization, #4 Albert Embankment, London, SE 17SR, United Kingdom.

(24) Uniform Classification Committee, 222 South Riverside Plaza, Chicago, Ill. 60606.

(25) [Reserved]

(26) USNRC: United States Nuclear Regulatory Commission, Washington, D.C. 20555.

(27) UN: United Nations: United Nations Sales Section, New York, New York 10017.

(28) OPPSD: Organic Peroxide Producers' Safety Division, Society of the Plastic Industries, Inc., 355 Lexington Avenue, New York, N.Y. 10017.

(29) ISO: International Organization for Standardization, Case Postale 56, CH-1211 Geneva 20, Switzerland. Also available from the American National Standards Institute, Inc., 1430 Broadway, New York, N.Y. 10018.

(30) National Motor Freight Traffic Association, Inc., Agent, 1616 "P" Street, NW., Washington, D.C. 20036.

(31) ICAO: International Civil Aviation Organization, P.O. Box 400, Place de l'Aviation Internationale, 1000 Sherbrooke Street West, Montreal, Quebec, Canada H3A 2R2. ICAO Technical Instructions available from INTEREG, International Regulations Publishing and Distribution Organization, P.O. Box 60105, Chicago, Illinois 60660.

(32) TDG Regulations: Canadian Government Publishing Center, Supply and Services Canada, Ottawa, Ontario, Canada K1 A 0S9.

(d) The full title and application of the matter incorporated by reference in Parts 170-189 of this chapter are as follows:

(1) ASME Code means section VIII (Division I) and IX of the 1977 edition of the "American Society of Mechanical Engineers Boiler and Pressure Vessel Code," and addenda thereto through December 31, 1978, except paragraph UW-11(a)(7) of the code does not apply.

(2) AAR Specifications for Tank Cars means the 1982 edition of the "Association of American Railroads Specifications for Tank Cars, Specification M-1002."

(3) Compressed Gas Association:

(i) CGA Pamphlet C-3 is titled, "Standards for Welding and Brazing on Thin Walled Containers," 1968 edition;

(ii) CGA Pamphlet C-6 is titled, "Standards for Visual Inspection of Compressed Gas Cylinders," 1975 edition;

(iii) Compressed Gas Association pamphlet C-7, Appendix A is titled, "A Guide for the Precautionary Markings for Compressed Gas Containers", dated May 15, 1971, Addenda issued January 1976.

(iv) CGA Pamphlet C-8 is titled, "Standard for Requalification of DOT-3HT Cylinders," 1972 edition.

(v) CGA Pamphlet S-1.2 is titled, "Pressure Relief Device Standards, Part 2, Cargo and Portable Tanks for Compressed Gases," 1980 edition;

(vi) CGA Pamphlet S-1.1 is titled, "Pressure Relief Device Standards Part 1—Cylinders for Compressed Gases," 1979 edition.

(vii) CGA Pamphlet C-12 is titled, "Qualification Procedure for Acetylene Cylinder Design," 1979 edition.

(viii) CGA Pamphlet C-14 is titled "Procedures for Fire Testing of DOT Cylinder Pressure Relief Device Systems," 1979 edition.

(ix) CGA Pamphlet G-4.1 is titled, "Cleaning Equipment for Oxygen Service," 1977 edition.

(4) American National Standards:

(i) American National Standard B9.1, is titled, "Safety Code for Mechanical Refrigeration," 1964 edition.

(ii) American National Standard B16.5 is titled, "Steel Pipe Flanges and Fittings," 1968 edition.

(iii) American National Standard N14.1 is titled, "Packaging of Uranium Hexafluoride for Transport," 1971 edition.

(5) American Society for Testing and Materials:

(i) ASTM D1310 is titled, "Standard Method of Test for Flash Point of Volatile Flammable Materials By Tag Open-Cup Apparatus," 1967 edition;

(ii) ASTM D323 is titled, "Test for Vapor Pressure of Petroleum Products (Reid Method)," 1968 edition.

(iii) ASTM D1056 is titled, "Sponge and Expanded Cellular Rubber Products, Spec. and Tests for," 1968 edition.

(iv) ASTM G 23-69 is titled, "Standard Recommended Practice for Operating Light- and Water-Exposure Apparatus (Carbon-Arc Type) for Exposure of Nonmetallic Materials," 1969 edition (reapproved 1975).

(v) ASTM G 26-70 is titled, "Standard Recommended Practice for Operating Light- and Water-Exposure Apparatus (Xenon-Arc Type) for Exposure of Nonmetallic Materials," 1970 edition.

(vi) ASTM D-638 is titled, "Test for Tensile Strength of Plastics", 1976 edition.

(vii) ASTM D-1505 is titled, "Test for Density of Plastics by the Density Gradient Technique", 1968 edition.

(viii) ASTM C148-77 is titled, "Standard Methods of Polariscopic Examination of Glass Containers," 1977 edition.

(ix) ASTM E487-74 is titled, "Standard Test Method for Constant-Temperature Stability of Chemical Materials," 1974 edition.

(x) ASTM B 557-79 is titled "Tension Testing Wrought and Cast Aluminum and Magnesium—Alloy Products" 1979 Edition.

(xi) ASTM B-221-76 is titled "Standard Specification for Aluminum Alloy Extruded Bars, Rods, Shapes and Tubes," 1976 Edition.

(xii) ASTM E 290-77 is titled "Semi-Guided Bend Test for Ductility of Metallic Materials," 1977 edition.

(xiii) ASTM D56-79 is titled "Standard Method of Test for Flash Point by Tag Closed Tester," 1979 edition.

(xiv) ASTM D3278-78 is titled "Standard Methods of Test for Flash Point of Liquids by Setaflash Closed Tester," 1978 edition.

(xv) ASTM D93-80 is titled "Standard Method of Test for Flash Point by Pensky-Martens Closed Tester," 1980 edition.

(xvi) ASTM 88-56 is titled "Standard Method of Test for Saybolt Viscosity," 1956 edition (reapproved 1968).

(xvii) ASTM D2161-79 is titled "Standard Method for Conversion of Kinematic Viscosity to Saybolt Universal Viscosity or to Saybolt Furol Viscosity," 1979 edition.

(xviii) ASTM D445-79 is titled "Standard Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (and the Calculation of Dynamic Viscosity," 1979 edition.

(xix) ASTM A 20-81 is titled, "Standard Specification for General Requirements for Steel Plates for Pressure Vessels," revision C, 1982 edition.

(xx) ASTM A 240-82 is titled, "Standard Specification for Heat-Resisting Chromium and Chromium-Nickel Stainless Steel Plate, Sheet and Strip for Fusion-Welded Unfired Pressure Vessels," revision A, 1982 edition.

(xxi) ASTM A 370-77 is titled, "Standard Methods and Definition for Mechanical Testing of Steel Products," 1982 edition.

(xxii) ASTM A 516-79b is titled, "Standard Specification for Pressure Vessel Plates, Carbon Steel, for Moderate- and Lower-Temperature Service," 1982 edition.

(xxiii) ASTM A 537-80 is titled "Standard Specification for Pressure Vessel Plates, Heat-Treated, Carbon-Manganese-Silicon Steel," 1982 edition.

(xxiv) ASTM A 242-81 is titled "Standard Specification for High-Strength Low-Alloy Structural Steel," 1981 edition.

(xxv) ASTM A 441-81 is titled "Standard Specification for High-Strength Low-Alloy Structural Manganese Vanadium Steel," 1981 edition.

(xxvi) ASTM A 514-81 is titled "Standard Specification for High-Yield-Strength, Quenched and Tempered Alloy Steel Plate, Suitable for Welding," 1981 edition.

(xxvii) ASTM A 572-82 is titled "Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Steels of Structural Quality," 1982 edition.

(xxviii) ASTM A 588-81 is titled "Standard Specification for High-Strength Low-Alloy Structural Steel with 50 ksi Minimum Yield Point to 4 in. Thick," 1981 edition.

(xxix) ASTM A 606-75 (Reapproved 1981) "Standard Specification for Steel Sheet and Strip, Hot-Rolled and Cold-Rolled, High Strength, Low-Alloy, with Improved Atmospheric Corrosion Resistance," 1981 edition.

(xxx) ASTM A 607-75 is titled "Standard Specification for Sheet and Strip, Hot-Rolled and Cold-Rolled, High-Strength, Low-Alloy Columbium and/or Vanadium," 1975 edition.

(xxxi) ASTM A 633-79a is titled "Standard Specification for Normalized High-Strength Low-Alloy Structural Steel," 1979 edition.

(xxxii) ASTM A 715-81 is titled "Standard Specification for Steel Sheet and Strip, Hot-Rolled, High-Strength, Low-Alloy, with improved Formability," 1981 edition.

(xxxiii) ASTM B 580-79 is titled "Standard Specification for Anodic Oxide Coatings on Aluminum," 1979 edition.

(6) NFPA Pamphlet No. 58 is titled, "Standard for the Storage and Handling of Liquefied Petroleum Gases," 1979 edition.

(7) Bureau of Explosives, Association of American Railroads:

(i) Bureau of Explosives Pamphlet No. 6 is titled, "Illustrating Methods for Loading and Bracing Carload and Less Than Carload Shipments of Explosives and Other Dangerous Articles," 1962 edition.

(ii) Bureau of Explosives Pamphlet No. 6A (includes Appendix No. 1, October 1944, and Appendix No. 2, December 1945) is titled, "Illustrating Methods for Loading and Bracing Carload and Less Than Carload Shipments of Loaded Projectiles, Loaded Bombs, Etc.," 1943 edition.

(iii) Bureau of Explosives Pamphlet No. 6C is titled, "Illustrating Methods for Loading and Bracing Trailers and Less-Than Trailer Shipments of Explosives and Other Dangerous Articles Via Trailer-on-Flat-Car (TOFC) or Container-on-Flat-Car (COFC)," September 1968.

(iv) Bureau of Explosives Pamphlets 1 and 2 titled, "Emergency Handling of Hazardous Materials in Surface Transportation," June 1973.

(8) NACE Standard TM-01-69 is titled, "Test Method Laboratory Corrosion Testing of Metals for the Process Industries," 1969 edition.

(9) IME Safety Library Publication No. 22 (IME Standard 22) is titled, "Recommendations for the Safe Transportation of Detonators in a Vehicle With Certain Other Explosive Materials." Revised January 1, 1985.

(10) IAEA "Regulations for the Safe Transport of Radioactive Materials, Safety Series No. 6, 1973 Revised Edition (as amended)."

(11) United States Nuclear Regulatory Commission (USNRC) 10 CFR Part 71, "Packaging of Radioactive Material for Transport and Transportation of Radioactive Material Under Certain Conditions."

(12) Federal Standard H28 is titled, "Screw-Thread Standards for Federal Services," March 31, 1978, edition.

(13) National Wooden Box Association's Specification 1-1B is titled "Specifications for Nailed Wooden and Lock Corner Boxes for Industrial Use," May 1958. Amended in part October 1961.

(14) American Water Works Association (AWWA) Standard C207-55 is titled, "AWWA Standard for Steel Pipe Flanges," 1955 edition.

(15) American Welding Society (AWS):

(i) AWS Code B-3.0 is titled, "Standard Qualification Procedure," 1972 edition.

(ii) AWS Code D-1.0 is titled, "Code for Welding in Building Construction," 1966 edition.

(16) USDC, CAPE-1662, one of the series of "Civilian Applications Program Engineering Drawings" which is a package of information including drawings and bills of material, describing phenolic-foam insulated, protective overpacks.

(i) USDC, USDOE Material and Equipment Specification No. SP-9, Rev. 1, and Supplement, is titled "Fire Resistant Phenolic Foam."

(ii) USDC, ORO-651 is titled, "Uranium Hexafluoride Handling Procedures and Container Criteria," Revision 3, 1972 edition.

(17) "International Maritime Dangerous Goods Code" (IMDG Code), Volumes I, II, III, and IV, 1977 Edition, and Amendments 14-76, 15-77, 16-78, 17-79, 18-79, 19-80 and 20-82 thereto.

(18) "Uniform Freight Classification 11."

(19) Federal Specification RR-C-901 b is titled "Cylinders, Compressed Gas:

With Valve or Plug and Cap; ICC 3AA, August 1, 1967."

(20) NIOSH Registry is titled, "Registry of Toxic Effects of Chemical Substances," 1978 edition, available from the Superintendent of Documents.

(21) United Nations Recommendations (UN Recommendations) is titled, "Transport of Dangerous Goods (1977)."

(22) SADT is titled, "Self Accelerating Decomposition Temperature Test," published by the OPPSD.

(23) USDOT, "Guidelines for Selecting Preferred Highway Routes for Large Quantity Shipments of Radioactive Materials."

(24) "ISO 82-1974(e) Steel-Tensile Testing," First Edition 1974-08-01.

(25) Aluminum Associations' Handbook is titled "Aluminum Standards and Data," Sixth Edition, 1979.

(26) National Motor Freight Classification, NMF 100-I", 1982.

(27) International Civil Aviation Organization Technical Instructions for the Safe Transport of Dangerous Goods by Air, DOC 9284-AN/905 (ICAO Technical Instructions), 1985 edition.

(28) "Transportation of Dangerous Goods Regulations" of Transport Canada (TDG Regulations), amended as of July 1, 1985, (Incorporating Registration Numbers SOR/85-77, SOR/85-585 and SOR/85-609).

(e) Matters referenced by footnote are included as part of the regulations of this subchapter.

(f) The material listed in this section has been approved for incorporation by reference by the Director of the Federal Register. These materials are incorporated as they exist on the date of the approval and a notice of any change in these materials will be published in the FEDERAL REGISTER. The material incorporated by reference is available for inspection at the Office of the Federal Register Information Center, Room 8301, 1100 L Street, NW, Washington, D.C. 20408.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 171-4, 34 FR 18247, Nov. 14, 1969]

EDITORIAL NOTE: For Federal Register citations affecting § 171.7, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 171.8 Definitions and abbreviations.

In this subchapter,

"Approved" means approval issued or recognized by the Department unless otherwise specifically indicated in this subchapter.

"Atmospheric gases" means gases that are commercially derived through an air separation process. For purposes of this subchapter, "atmospheric gases" means argon, krypton, neon, nitrogen, oxygen and xenon.

"Away from" See § 176.83.

"Barge" means a non-selfpropelled vessel.

"Bottle" means a container having a neck of relatively smaller cross section than the body and an opening capable of holding a closure for retention of the contents.

"Break-bulk" means packages of hazardous materials that are handled individually, palletized, or unitized for purposes of transportation as opposed to bulk and containerized freight.

"Btu" means British thermal unit.

"Bureau of Explosives" means the Bureau of Explosives (B of E) of the Association of American Railroads.

"C" means Celsius or Centigrade.

"Captain of the Port" means the Officer of the Coast Guard, under the command of a District Commander, so designated by the Commandant for the purpose of giving immediate direction to Coast Guard law enforcement activities within his assigned area or, with respect to remaining areas in his District not assigned to officers designated by the Commandant, the District Commander.

"Carfloat" means a vessel that operates on a short run on an irregular basis and serves one or more points in a port area as an extension of a rail line or highway over water, and does not operate in ocean, coastwise, or ferry service.

"Cargo aircraft only" means an aircraft that is used to transport cargo and is not engaged in carrying passengers.

"Cargo tank" means any tank permanently attached to or forming a part of any motor vehicle or any bulk liquid or compressed gas packaging not permanently attached to any motor vehicle which by reason of its size, construction, or attachment to a motor vehicle, is loaded or unloaded without being removed from the motor vehicle. Any packaging fabricated under specifications for cylinders is not a cargo tank.

"Cargo vessel" means: (1) Any vessel other than a passenger vessel; and

(2) Any ferry being operated under authority of a change of character certificate issued by a Coast Guard Officer-in-Charge, Marine Inspection.

"Carrier" means a person engaged in the transportation of passengers or property by:

(1) Land or water, as a common, contract, or private carrier, or

(2) Civil aircraft.

"CC" means closed-cup.

"Character of vessel" means the type of service in which the vessel is engaged at the time of carriage of a hazardous material.

"Class A explosives" See § 173.53.

"Class B explosives" See § 173.88.

"Class C explosives" See § 173.100.

"COFC" means container-on-flatcar.

"Combustible liquid" See § 173.115.

"Competent authority" means a national agency responsible under its national law for the control or regulation of a particular aspect of the transportation of hazardous materials (dangerous goods). The term "Appropriate authority", as used in the ICAO Technical Instructions, has the same meaning as "Competent Authority". The Director, Office of Hazardous Materials Transportation, Research and Special Programs Administration, is the United States Competent Authority for purposes of this subchapter and 46 CFR Parts 64 and 146.

"Compressed gas" See § 173.300.

"Consumer commodity" means a material that is packaged and distributed in a form intended or suitable for sale through retail sales agencies or instrumentalities for consumption by individuals for purposes of personal care or household use. This term also includes drugs and medicines.

"Containership" means a cargo vessel designed and constructed to transport, within specifically designed cells, portable tanks and freight containers which are lifted on and off with their contents intact.

"Corrosive material" See § 173.240.

"Crewmember" means a person assigned to perform duty in an aircraft during flight time.

Cryogenic liquid. See § 173.300(f).

"Cylinder" means a pressure vessel designed for pressures higher than 40 psia and having a circular cross section. It does not include a portable tank, multi-unit tank car tank, cargo tank, or tank car.

"District Commander" means the District Commander of the Coast Guard, or his authorized representative, who has jurisdiction in the particular geographical area.

"DOD" means the U.S. Department of Defense.

"Designated facility" means a hazardous waste treatment, storage, or disposal facility that has been designated on the manifest by the generator.

"Engine" means a locomotive propelled by any form of energy and used by a railroad.

"EPA" means U.S. Environmental Protection Agency.

"Etiologic agent" See § 173.386.

"F" means degree Fahrenheit.

"Ferry vessel" means a vessel which is limited in its use to the carriage of deck passengers or vehicles or both, operates on a short run on a frequent schedule between two points over the most direct water route, other than in ocean or coastwise service, and is offered as a public service of a type normally attributed to a bridge or tunnel.

"Filling density" has the following meanings:

(1) For compressed gases in cylinders, see § 173.304(a)(2) Table Note 1.

(2) For compressed gases in tank cars, see § 173.314(c) Table Note 1.

(3) For compressed gases in cargo tanks and portable tanks, see § 173.315(a) Table Note 1.

(4) For cryogenic liquids in cylinders, except hydrogen, see § 173.316(c)(1).

(5) For hydrogen, cryogenic liquid in cylinders, see § 173.316(c)(3) Table Note 1.

(6) For cryogenic liquids in cargo tanks, see § 173.318(f)(1).

(7) For cryogenic liquids in tank cars, see § 173.319(d)(1).

"Flammable gas" See § 173.300(b).

"Flammable liquid" See § 173.115 (a)(1).

"Flammable solid" See § 173.150.

"Flash point" means the minimum temperature at which a substance gives off flammable vapors which in contact with spark or flame will ignite. For liquids, see § 173.115 and for solids, see § 173.150.

"Freight container" means a reusable container having a volume of 64 cubic feet or more, designed and constructed to permit being lifted with its contents intact and intended primarily for containment of packages (in unit form) during transportation.

"Fuel tank" means a tank other than a cargo tank, used to transport flammable or combustible liquid, or compressed gas for the purpose of supplying fuel for propulsion of the transport vehicle to which it is attached, or for the operation of other equipment on the transport vehicle.

"Gross weight" means the weight of a packaging plus the weight of its contents.

"Hazardous material" means a substance or material which has been determined by the Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce, and which has been so designated.

"Hazardous substance", for the purposes of this subchapter, means a material, and its mixtures or solutions, that is identified by the letter "E" in Column 1 of the Table to § 172.101 when offered for transportation in one package, or in one transport vehicle if not packaged, and when the quantity of the material therein equals or exceeds the reportable quantity (RQ). This definition does not apply to petroleum products that are lubricants or fuels; or to a mixture or solution containing a material identified by the letter "E" in Column 1 of the Table to § 172.101 if it is in a concentation less than that shown in the following table based on the reportable quantity (RQ) specified for the materials in Column 2 of the Table to § 172.101:

RQ pounds	RQ kilograms	Concentration by weight	
		Percent	PPM
5000	2270	10	100,000
1000	454	2	20,000
100	45.4	0.2	2,000
10	4.54	0.02	200
1	0.45	0.002	20

"Hazardous waste", for the purposes of this subchapter, means any material that is subject to the hazardous waste manifest requirements of the EPA specified in 40 CFR Part 262 or would be subject to these requirements absent an interim authorization to a state under 40 CFR Part 123, Subpart F.

"Hermetically sealed" means closed by fusion, gasketing, crimping, or equivalent means so that no gas or vapor can enter or escape.

"IAEA" means International Atomic Energy Agency.

"IATA" means International Air Transport Association.

"ICAO" means International Civil Aviation Organization.

"IM Tank Table" means the table (with preface) listing hazardous materials approved by the Director, OHMT for carriage in IM portable tanks under special conditions specified therein.

"IMO" means International Maritime Organization.

"Intermodal container" means a freight container designed and constructed to permit it to be used interchangeably in two or more modes of transport.

"Intermodal portable tank" or "IM portable tank" means a specific class of portable tanks designed primarily for international intermodal use.

"Irritating material" See § 173.381.

"Limited quantity," when specified as such in a section applicable to a particular material, with the exception of Poison B materials, means the maximum amount of a hazardous material for which there is a specific labeling and packaging exception.

"Magnetic materials" See § 173.1020.

"Magazine vessel" means a vessel used for the receiving, storing, or dispensing of explosives.

"Marking" means applying the descriptive name, instructions, cautions, weight, or specification marks or combination thereof required by this subchapter to be placed upon outside containers of hazardous materials.

"Mixture" means a material composed of more than one chemical compound or element.

"Mode" means any of the following transportation methods; rail, highway, air, or water.

"Motor vehicle" includes a vehicle, machine, tractor, trailer, or semitrailer, or any combination thereof, propelled or drawn by mechanical power and used upon the highways in the transportation of passengers or property. It does not include a vehicle, locomotive, or car operated exclusively on a rail or rails, or a trolley bus operated by electric power derived from a fixed overhead wire, furnishing local passenger transportation similar to street-railway service.

"Name of contents" means the proper shipping name as specified in § 172.101 or § 172.102 (when authorized).

"Navigable waters" means, for the purposes of this subchapter, waters of the United States, including the territorial seas.

"Net weight" means a measure of weight referring only to the contents of a package, and does not include the weight of any packaging material.

"N.O.S." means not otherwise specified.

"NPT" means an American Standard taper pipe thread in compliance with the requirements of Federal Standard H28, Part II, Section VII. See § 171.7(d)(12).

"NRC (non-reusable container)" means a container whose reuse is restricted in accordance with the provisions of § 173.28.

"Occupied caboose" means a rail car being used to transport non-passenger personnel.

"Officer in Charge, Marine Inspection" means a person from the civilian or military branch of the Coast Guard designated as such by the Commandant and who under the supervision and direction of the Coast Guard District Commander is in charge of a designated inspection zone for the performance of duties with respect to the enforcement and administration of Title 52, Revised Statutes, acts amendatory thereof or supplemental thereto, rules and regulations thereunder, and the inspection required thereby.

"Operator" means a person who controls the use of an aircraft, vessel, or vehicle.

"Organic peroxide" See § 173.151.

"ORM" means Other Regulated Materials.

"Outage" or "ullage" means the amount by which a packaging falls short of being liquid full, usually expressed in percent by volume.

"Outside container" means the outermost enclosure used in transporting a hazardous material other than a freight container.

"Overpack" except when referenced to a packaging specified in Part 178 of this subchapter, means an enclosure that is used by a single consignor to provide protection or convenience in handling of a package or to consolidate two or more packages. "Overpack" does not include a freight container.

"Oxidizer" or "Oxidizing material" See § 173.151.

"Package" or "Outside Package" means a packaging plus its contents. For radioactive materials, see § 173.403 of this subchapter.

"Packaging" means the assembly of one or more containers and any other components necessary to assure compliance with the minimum packaging requirements of this subchapter and includes containers (other than freight containers or overpacks), portable tanks, cargo tanks, tank cars, and multi-unit tank car tanks. For radioactive materials, see § 173.403 of this subchapter.

"Passenger" (With respect to vessels and for the purposes of Part 176 only) means a person being carried on a vessel other than:

(1) The owner or his representative;

(2) The operator;

(3) A bona fide member of the crew engaged in the business of the vessel who has contributed no consideration for his carriage and who is paid for his services; or

(4) A guest who has not contributed any consideration directly or indirectly for his carriage.

"Passenger-carrying aircraft" means an aircraft that carries any person other than a crewmember, company employee, an authorized representative of the United States, or a person accompanying the shipment.

"Passenger vessel" means—(1) A vessel subject to any of the requirements of the International Convention for the Safety of Life at Sea, 1960, which carries more than 12 passengers;

(2) A cargo vessel documented under the laws of the United States and not subject to the Convention, which carries more than 16 passengers;

(3) A cargo vessel of any foreign nation that extends reciprocal privileges and is not subject to the Convention and which carries more than 16 passengers; and

(4) A vessel engaged in a ferry operation and which carries passengers.

"Person" means an individual, firm, co-partnership, corporation, company, association, or joint-stock association, and includes any trustee, receiver, assignee, or personal representative thereof.

"Placarded car" means a rail car which is placarded in accordance with the requirements of Part 172 of this subchapter except those cars displaying only the FUMIGATION placards as required by § 172.510.

"Poison A" See § 173.326.

"Poison B" See § 173.343.

"Portable tank" means any packaging (except a cylinder having a 1000-pound or less water capacity) over 110 U.S. gallons capacity and designed primarily to be loaded into or on or temporarily attached to a transport vehicle or ship, and equipped with skids, mounting, or accessories to facilitate handling of the tank by mechanical means. It does not include any cargo tank, tank car tank, tank of the DOT-106A or 110A type, or trailers carrying 3AX, 3AAX, or 3T cylinders.

"Preferred route" or "Preferred highway" is a highway for shipment of "highway route controlled quantities" of radioactive materials so designated by a State routing agency, and any Interstate System highway for which an alternative highway has not been designated by such State agency as provided by § 177.825(b) of this subchapter.

"Private track" or "Private siding" means track located outside of a carrier's right-of-way, yard, or terminals where the carrier does not own the rails, ties, roadbed, or right-of-way and includes track or portion of track which is devoted to the purpose of its user either by lease or written agreement, in which case the lease or written agreement is considered equivalent to ownership.

"Proper shipping name" means the name of the hazardous material shown in Roman print (not italics) in § 172.101 of this subchapter.

"P.s.i." or "psi" means pounds per square inch.

"P.s.i.a. or psia" means pounds per square inch absolute.

"P.s.i.g. or psig" means pounds per square inch gauge.

"Public vessel" means a vessel owned by and being used in the public service of the United States. It does not include a vessel owned by the United States and engaged in a trade or commercial service or a vessel under contract or charter to the United States.

"Pyrophoric liquid" See § 173.115.

"Pyrophoric solid" See § 173.150.

"Radioactive materials" See § 173.403 of this subchapter for definitions relating to radioactive materials.

"Railroad" means a person engaged in transportation by rail.

"Rail freight car" means a car designed to carry freight or non-passenger personnel by rail, and includes a box car, flat car, gondola car, hopper car, tank car, and occupied caboose.

"Reportable quantity (RQ)" for the purposes of this subchapter means the quantity specified in Column 2 of the Table to § 172.101, for any material identified by the letter "E" in Column 1.

"Research" means investigation of experimentation aimed at the discovery of new theories or laws and the discovery and interpretation of facts or revision of accepted theories or laws in the light of new facts.

"Residue" means the hazardous material remaining in a packaging after its contents have been emptied and before the packaging is refilled, or cleaned and purged of vapor to remove any potential hazard. Residue of a hazardous material, as applied to the contents of a tank car (other than DOT Specification 106 or 110 tank cars), means a quantity of material no greater than 3 percent of the car's marked volumetric capacity.

"RSPA" means the Research and Special Programs Administration, U.S. Department of Transportation, Washington, D.C. 20590.

"SCF" (standard cubic foot) means one cubic foot of gas measured at 60° F. and 14.7 psia.

"Separated by a complete hold or compartment from" See § 176.83.

"Separated from" See § 176.83.

"Separated longitudinally by a complete hold or compartment from" See § 176.83.

"Sheathing" means a covering consisting of a smooth layer of wood placed over metal and secured to prevent any movement.

"Shipping paper" means a shipping order, bill of lading, manifest or other shipping document serving a similar purpose and containing the information required by §§ 172.202, 172.203 and 172.204.

"STC (single-trip container)" means a container that may not be refilled and reshipped after having been previously emptied, except as provided in § 173.28.

"Solution" means any homogeneous liquid mixture of two or more chemical compounds or elements that will not undergo any segregation under conditions normal to transportation.

"Spontaneously combustible material (solid)" means a solid substance (including sludges and pastes) which may undergo spontaneous heating or self-ignition under conditions normally incident to transportation or which may upon contact with the atmosphere undergo an increase in temperature and ignite.

"State-designated route" means a preferred route selected in accordance with U.S. DOT "Guidelines for Selecting Preferred Highway Routes for Large Quantity Shipments of Radioactive Materials" or an equivalent routing analysis which adequately considers overall risk to the public. Designation must have been preceded by substantive consultation with affected local jurisdictions and with any other affected States to ensure consideration of all impacts and continuity of designated routes.

"State routing agency" means an entity (including a common agency of more than one State such as one established by Interstate compact) which is authorized to use State legal process pursuant to § 177.825 of this subchapter to impose routing requirements, enforceable by State agencies, on carriers of radioactive materials without regard to intrastate jurisdictional boundaries. This term also includes Indian tribal authorities which have police powers to regulate and enforce highway routing requirements within their lands.

"Stowage" means the act of placing hazardous materials on board a vessel.

"Strong outside container" means the outermost enclosure which provides protection against the unintentional release of its contents under conditions normally incident to transportation.

"Technical name" means a recognized chemical name currently used in scientific and technical handbooks, journals, and texts. Generic descriptions authorized for use as technical names are, Organic phosphate compound, Organic phosphorus compound, Organic phosphate compound mixture, Organic phosphorus compound mixture, Methyl parathion, and Parathion.

"TOFC" means trailer-on-flat-car.

"Trailership" means a vessel other than a carfloat, specifically equipped to handle highway vehicles, and fitted with installed securing devices to tie down each vehicle.

"Train" means one or more engines coupled with one or more rail cars, except during switching operations or where the operation is that of classifying and assembling rail cars within a railroad yard for the purpose of making or breaking up trains.

"Trainship" means a vessel other than a rail car ferry or carfloat, specifically equipped to transport railroad vehicles, and fitted with installed securing devices to tie down each vehicle.

"Transport vehicle" means a motor vehicle or rail car used for the transportation of cargo by any mode. Each cargo-carrying body (trailer, railroad freight car, etc.) is a separate transport vehicle.

"UFC" means Uniform Freight Classification.

"Unit load device" means any type of freight container, aircraft container, aircraft pallet with a net, or aircraft pallet with a net over an igloo.

"United States" means the fifty States, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, American Samoa, or Guam.

"Vessel" includes every description of watercraft, used or capable of being used as a means of transportation on the water.

"Viscous liquid" means a liquid material which has a measured viscosity in excess of 2500 centistokes at 25° C (77° F.) when determined in accordance with the procedures specified in ASTM Method D 445-72 "Kinematic Viscosity of Transparent and Opaque Liquids (and the Calculation of Dynamic Viscosity)" or ASTM Method D 1200-70 "Viscosity of Paints, Varnishes, and Lacquers by Ford Viscosity Cup."

"Volatility" refers to the relative rate of evaporation of materials to assume the vapor state.

"Water reactive material (solid)" means any solid substance (including sludges and pastes) which, by interaction with water, is likely to become spontaneously flammable or to give off flammable or toxic gases in dangerous quantities.

"Water resistant" means having a degree of resistance to permeability by and damage caused by water in liquid form.

"W.T." means watertight.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 171-32, 41 FR 15994, Apr. 15, 1976]

EDITORIAL NOTE: For Federal Register citations affecting § 171.8, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

EFFECTIVE DATE NOTE: The definition "Residue" was added at 50 FR 39007, Sept. 26, 1985, effective October 1, 1986.

§ 171.9 Rules of construction.

(a) In this subchapter, unless the context requires otherwise: (1) Words imparting the singular include the plural;

(2) Words imparting the plural include the singular; and

(3) Words imparting the masculine gender include the feminine;

(b) In this subchapter, the word: (1) "Shall" is used in an imperative sense;

(2) "Must" is used in an imperative sense;

(3) "Should" is used in a recommendatory sense;

(4) "May" is used in a permissive sense to state authority or permission to do the act described, and the words "no person may * * *" or "a person may not * * *" means that no person is required, authorized, or permitted to the act described; and

(5) "Includes" is used as a word of inclusion not limitation.

[Amdt. 171-32, 41 FR 15996, Apr. 15, 1976, as amended by Amdt. 171-32A, 41 FR 40630, Sept. 20, 1976]

§ 171.10 Flammable or combustible liquids in bulk on board vessels.

(a) Nothing in Parts 170-189 of this subchapter shall be construed as affecting the transportation of flammable or combustible liquids in bulk on board vessels which transportation is governed by the rules and regulations promulgated under R.S. 4417a; 46 U.S.C. 391a (46 CFR Part 146).

[29 FR 18653, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 171-42, 43 FR 48643, Oct. 19, 1978]

§ 171.11 Use of ICAO Technical Instructions.

Notwithstanding the requirements of Parts 172 and 173 of this subchapter, a hazardous material may be transported by aircraft, and by motor vehicle either before or after being transported by aircraft, in accordance with the ICAO Technical Instructions if the hazardous material:

(a) Is packaged, marked, labeled, classified, described and certified on a shipping paper and otherwise in a condition for shipment as required by the ICAO Technical Instructions;

(b) Is within the quantity limits prescribed for transportation by either passenger-carrying or cargo aircraft, as appropriate, as specified in the ICAO Technical Instructions;

(c) Is not a forbidden material or package according to § 173.21 or Column (3) of the Table to § 172.101 of this subchapter; and,

(d) Fulfills the following additional requirements as applicable:

(1) When a hazardous material, which is subject to the requirements of the ICAO Technical Instructions, is also a hazardous substance as defined in this subchapter:

(i) The name of the hazardous substance shall be entered on shipping papers in association with the basic description, and in association with the proper shipping name required to be marked on the package, unless the proper shipping name required by the ICAO Technical Instructions already includes the name of the hazardous substance; and

(ii) The letters "RQ" shall be entered on the shipping paper either before or after the basic description required by the ICAO Technical Instructions and in association with the proper shipping name required to be marked on the package.

(2) When a hazardous material, which is subject to the requirements of the ICAO Technical Instructions, is also a hazardous waste as defined in this subchapter:

(i) The word "Waste" must precede the proper shipping name on shipping papers and package markings; and

(ii) It must comply with § 172.205 with respect to the hazardous waste manifests.

(3) When a hazardous material is not subject to the requirements of the ICAO Technical Instructions, it must be transported as required by this subchapter.

(4) When a hazardous material, that is regulated by this subchapter for transportation by highway, is transported by motor vehicle on a public highway under the provisions of this section, the motor vehicle must be placarded in accordance with Subpart F of Part 172 of this subchapter and the shipping paper must include:

(i) With the exception of hazardous materials in ICAO Class 6.1, Packaging Group III, and in ICAO Class 9, the name of the DOT hazard class most closely corresponding to the ICAO Class in association with the basic description required by the ICAO Technical instructions unless the shipping name contains the key word or words of the hazard class of the material;

(ii) The letters "ORM-E" in association with the basic description for a material in ICAO Class 6.1, Packing Group III or in ICAO Class 9, that is also a hazardous substance;

(iii) The words "Dangerous When Wet" in association with the basic description when the Class 4, Division 4.3 label is required to be applied by the ICAO Technical Instructions; and

(iv) Should include an indication that the shipment is being made under the provisions of this section or the letters "ICAO."

(5) If a liquid or solid material in a package meets the definition of a poison according to this subchapter, and the fact that it is a poison is not disclosed in the shipping name or by a class entry, an indication that the material is a poison shall be entered on the shipping paper in association with the basic description. For transportation by motor vehicle, this indication must be made by entering the word "Poison" on the shipping paper in association with the basic description.

(6) For radioactive materials:

(i) Shipping papers for highway route controlled quantity radioactive materials shipments must meet the requirements of § 172.203(d)(1)(iii) of this subchapter,

(ii) Competent authority certification and any necessary revalidation for Type B, Type B(U), Type B(M), and fissile materials packages must be obtained from the appropriate authorities as specifed in §§ 173.471, 173.472 and 173.473 of this subchapter, and all requirements of the certificates and revalidations must be met,

(iii) The provisions of §§ 172.204(c)(4), 173.448 (e), (f) and (g)(3) of this subchapter apply,

(iv) Limited quantities of radioactive materials must meet the provisions of

§ 173.421, § 173.422 or § 173.424 as appropriate of this subchapter, and

(v) Type A package contents shall be limited in accordance with § 173.431 of this subchapter.

(7) If a United States variation is indicated in the ICAO Technical Instructions for any provision governing the transport of the hazardous material, the hazardous material is transported in conformance with that variation.

(8) Abbreviations may not be used in shipping paper entries or package markings unless they are specifically authorized by this subchapter. ICAO class or division numbers are not considered to be abbreviations.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 171-69, 47 FR 54821, Dec. 6, 1982, as amended by Amdt. 171-71, 48 FR 10224, Mar. 10, 1983; Amdt. 171-71, 48 FR 31217, July 7, 1983; Amdt. 171-77, 48 FR 53712, Nov. 29, 1983]

§ 171.12 Import and export shipments.

(a) Except in the case of a shipment from Canada conforming to § 173.12a of this subchapter, each person importing a hazardous material into the United States shall provide the shipper and the forwarding agent at the place of entry into the United States timely and complete information as to the requirements of this subchapter that will apply to the shipment of the material within the United States. The shipper, directly or through the forwarding agent at the place of entry, shall provide the initial carrier in the United States the certificate of compliance required by § 172.204 of this subchapter. The carrier may not accept the material for transportation unless the required certification is provided.

(b) Except for Class A and Class B explosives and radioactive materials, a hazardous material which is classed and labeled in accordance with the conditions and limitations specified in § 172.102 of this subchapter when being imported into or exported from the United States, or passing through the United States in the course of being shipped between places outside the United States, may be offered and accepted for transportation and transported within the United States if it is otherwise offered, accepted, and transported in accordance with this subchapter. In addition, an appropriate shipping name specified for a material in § 172.102 of this subchapter may be substituted for its proper shipping name in § 172.101 of this subchapter (subject to the conditions and limitations of this paragraph and § 172.102 of this subchapter) if all or a portion of the transportation of the material is by vessel.

(c) The requirements of § 171.2 with respect to specification identification markings on packages notwithstanding, a package of hazardous materials (other than a compressed gas cylinder or a package of more than 110 gallons capacity) being imported into or exported from the United States or passing through the United States in the course of being shipped between places outside the United States may be offered and accepted for transportation and transported within the United States if the package specification identification markings required by Part 178 of this subchapter are clearly and legibly displayed on the surface of the package or on decals or tags securely affixed to the package, and the package is otherwise offered, accepted, and transported in accordance with this subchapter.

(d) Section 171.2 notwithstanding, a hazardous material (other than Class A or B explosives or radioactive materials) being imported into or exported from the United States or passing through the United States in the course of being shipped between places outside the United States may be offered and accepted for transportation and transported by motor vehicle within a single port area (including contiguous harbors) when packaged, marked, classed and labeled in accordance with the IMDG Code, if the hazardous material is offered and accepted in accordance with the requirements of Subparts C and F of Part 172 of this subchapter pertaining to shipping papers and placarding. (See § 176.11 of this subchapter for exceptions applicable to vessels.)

(e) Radioactive materials being imported into or exported from the United States, or passing through the

United States in the course of being shipped between places outside the United States, may be offered and accepted for transportation when packaged, marked, labeled and otherwise prepared for shipment in accordance with IAEA "Regulations for the Safe Transport of Radioactive Materials, Safety Series No. 6, 1973 Revised Edition (as amended)", if:

(1) Highway route controlled quantities (see § 173.403 of this subchapter) are shipped in accordance with §§ 172.203(d)(1)(iii), 172.507, 173.22(c), and 177.825 of this subchapter;

(2) For fissile materials and Type B packages, the competent authority certification and any necessary revalidation is obtained from the appropriate competent authorities as specified in §§ 173.471, 173.472 and 173.473 of this subchapter; and all requirements of the certificates and revalidations are met;

(3) Type A package contents shall be limited in accordance with § 173.431 of this subchapter;

(4) The country of origin for the shipment has adopted the IAEA "Regulations for the Safe Transport of Radioactive Materials, Safety Series No 6, 1973, Revised Edition (as amended)"; and

(5) The requirements of § 173.448(e), (f), and (g)(3) of this subchapter are fulfilled, when applicable.

(f) The provisions of paragraphs (b) and (d) of this section also apply to transportation, a portion of which includes transportation by vessel, between points in a State or between States.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 171-32, 41 FR 15996, Apr. 15, 1976]

EDITORIAL NOTE: For Federal Register citations affecting § 171.12, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 171.12a Canadian shipments and packagings.

(a) Notwithstanding the requirements of Part 172 and 173 of this subchapter, and except as provided in paragraph (b) of this section, a hazardous material that is classed, packaged, marked, labeled, placarded and described on a shipping paper in accordance with the Regulations Respecting the Handling, Offering for Transport and Transporting of Dangerous Goods (the Transportation of Dangerous Goods Regulations or TDG Regulations), issued by the Government of Canada, may be transported by rail or highway from the point of entry in the United States to its destination in the United States, or through the United States en route to a point in Canada, provided that it fulfills the following additional requirements as applicable:

(1) When a hazardous material is not subject to the requirements of the TDG Regulations, it must be transported as required by this subchapter.

(2) When a hazardous material, that is subject to this subchapter for transportation by rail or highway is transported under the provisions of this section, the shipping paper must include the following:

(i) The words "Dangerous When Wet" in association with the basic description when the Class 4, Division 4.3 label is required to be applied by the TDG Regulations.

(ii) The words "Poison" in association with the basic description if a liquid or solid material in a packaging meets the definition of a poison according to this subchapter, and the fact that it is a poison is not disclosed in the shipping name or by a class entry.

(3) When a hazardous material, which is subject to the requirements of the TDG Regulations, is also a hazardous substance as defined in this subchapter, the shipping paper must include the following:

(i) The name of the hazardous substance shall be entered on shipping papers in association with the proper shipping name required to be marked on the package, unless the proper shipping name required by the TDG Regulations already includes the name of the hazardous substance; and

(ii) The letters "RQ" shall be entered on the shipping paper either before or after the basic description required by the TDG Regulations and in association with the proper shipping name required to be marked on the package.

(4) When a hazardous material, which is subject to the requirements of the TDG Regulations, is also a hazardous waste as defined in this subchapter:

(i) The word "Waste" must precede the proper shipping name on shipping papers and package markings; and

(ii) It must be accompanied by a hazardous waste manifest executed as required by § 172.205 of this subchapter.

(5) Required shipping paper entries and package markings must be in English. Abbreviations may not be used in shipping paper entries or package markings unless they are specifically authorized by this subchapter. TDG Regulations class or division numbers are not considered to be abbreviations. Hazardous materials identification numbers must be preceded by "UN" or "NA". The use of an identification number preceded by "PIN" is not authorized.

(6) Shipments of radioactive materials must conform to the requirements of § 171.12(e).

(b) This section does not apply to:

(1) A material which is a forbidden material according to § 173.21 of this subchapter, or as indicated in Column (3) of the Table § 172.101 of this subchapter;

(2) A material or article meeting the definition of a Class A, B or C explosive according to this subchapter, except that, notwithstanding the requirements of Part 172 of this subchapter:

(i) For transportation between the United States and Canada, a package may be labeled and a freight container, motor vehicle or rail car placarded, with the label and placard required by the TDG Regulations provided that label or placard also indicates the appropriate DOT hazard class in accordance with Schedule V of the TDG Regulations;

(ii) Explosives may be transported from the point of entry in the United States to their destination in the United States, or through the United States en route to a point in Canada, when described on a shipping paper in accordance with the TDG Regulations provided the shipping paper also includes the letters "DOT:" followed by the proper shipping name and hazard class prescribed for explosives in this subchapter.

(c) Notwithstanding the requirements of Part 172 of this suchapter, a hazardous material included in Division 3 or 4 of Class 2 of the TDG Regulations may be transported from its point of origin in the United States to Canada, or through the United States en route to a point in Canada, when the package is labeled, and the freight container, motor vehicle or rail car is placarded, as required by the TDG Regulations provided the shipping paper contains an indication that these labels and placards have been applied in conformance with this paragraph for the purpose of transport to Canada.

(d) Except as specified in 173.301(i) of this subchapter, specification packagings made and maintained in full compliance with the corresponding specifications prescribed by the Railway Transport Committee of the Canadian Transport Commission (formerly the Board of Transport Commissioner for Canada), in its Regulations for the Transportation of Dangerous Commodities by Rail, and marked in accordance therewith (e.g., BTC, CTC, etc.) may be used for the shipment of hazardous materials within the United States.

(e) For transportation by rail, hazardous materials transported in accordance with paragraph (a) of this section may, in addition, be packaged and otherwise transported in conformance with the regulations of the Canadian Transport Commission from the point of entry in the United States to their destination in the United States, or through the United States en route to a point in Canada. Subject to the conditions and limitations of paragraphs (a) and (b) of this section, empty rail tank cars may be transported in conformity with Canadian Transport Commission regulations from point of origin in the United States to point of entry into Canada.

(f) Except as provided in paragraphs (a) and (d) of this section, hazardous materials transported by highway in accordance with this section must be packaged and otherwise transported as required by this subchapter. Subject to the conditions and limitations of paragraphs (a) and (b) of this section, empty cargo tanks may be returned to Canada in conformance with TDG Regulations provided they are otherwise transported as required by this subchapter.

[Amdt. 171-83, 50 FR 41520, Oct. 11, 1985]

§ 171.13 Emergency regulations.

(a) Until further order of the Department, shipments of explosives may be made upon requests of the Departments of the Army, Navy, and Air Force of the United States Government complying with the following:

(1) Shippers' and carriers' regulations; handling detonating agents and explosives and explosive ammunition in same car or vehicle. Detonating fuzes, class A explosives, primer-detonator assemblies or other detonating elements containing explosive components, if of a safe type, may be shipped either assembled in bombs, depth charges, mines, projectiles, or torpedoes (torpedo warheads) or in properly packed containers in the same car or vehicle with bombs, depth charges, mines, projectiles, boosters, or torpedoes (torpedo warheads) when separated from the explosive bombs, depth charges, mines, projectiles, boosters, or torpedoes (torpedo warheads) by not less than 3 feet. The intervening space of 3 feet must be filled with dry sand or dry earth in bags or in a crib so constructed or lined as to prevent sifting of the sand or earth. The crib must be secured against movement.

(2) When bomb fuzes are packed with bomb fin assemblies, either crated or boxed in wooden or metal containers, the sand or earth filled space between bombs and the fuzes may be omitted provided adequate blocking and bracing is supplied to prevent the bombs from crushing and injuring the detonating fuzes due to ordinary shocks incident to transportation.

[29 FR 18653, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

§ 171.14 Specification markings.

(a) Notwithstanding any other requirements of Parts 170-189 of this subchapter, the letters "ICC" may continue to be placed on any packaging requiring specification markings until January 1, 1970.

(b) Packagings with the specification markings "ICC" placed thereon before January 1, 1970, may be continued in service as marked.

[Amdt. 171-2, 33 FR 17918, Dec. 3, 1968, as amended by Amdt. 171-42, 43 FR 48643, Oct. 19, 1978]

§ 171.15 Immediate notice of certain hazardous materials incidents.

(a) At the earliest practicable moment, each carrier who transports hazardous materials (including hazardous wastes) shall give notice in accordance with paragraph (b) of this section after each incident that occurs during the course of transportation (including loading, unloading and temporary storage) in which as a direct result of hazardous materials:

(1) A person is killed;

(2) A person receives injuries requiring his hospitalization;

(3) Estimated carrier or other property damage exceeds $50,000;

(4) Fire, breakage, spillage, or suspected radioactive contamination occurs involving shipment of radioactive material. (See also §§ 174.45, 175.45, 176.48, and 177.807 of this subchapter.); or

(5) Fire, breakage, spillage, or suspected contamination occurs involving shipment of etiologic agents; or

(6) A situation exists of such a nature that, in the judgment of the carrier, it should be reported in accordance with paragraph (b) of this section even though it does not meet the criteria of paragraph (a)(1), (2), or (3) of this section; e.g., a continuing danger to life exists at the scene of the incident.

(b) Each notice required by paragraph (a) of this section shall be given to the Department by telephone (toll-free) on 800-424-8802. Notice involving etiologic agents may be given the Director, Center for Disease Control, U.S. Public Health Service, Atlanta, Ga., Area Code (404) 633-5313, in place of the notice to the Department or (toll call) on 202-426-2675. Each notice must include the following information:

(1) Name of reporter.

(2) Name and address of carrier represented by reporter.

(3) Phone number where reporter can be contacted.

(4) Date, time, and location of incident.

(5) The extent of injuries, if any.

(6) Classification, name, and quantity of hazardous materials involved, if such information is available.

(7) Type of incident and nature of hazardous material involvement and whether a continuing danger to life exists at the scene.

(c) Each carrier making a report under this section shall also make the report required by § 171.16.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 171-7, 35 FR 16837, Oct. 3, 1970]

EDITORIAL NOTE: For Federal Register citations affecting § 171.15, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 171.16 Detailed hazardous materials incident reports.

(a) Each carrier who transports hazardous materials shall report in writing in duplicate on DOT Form F 5800.1[1] to the Department within 15 days of the date of discovery, each incident that occurs during the course of transportation (including loading, unloading, or temporary storage) in which, as a direct result of the hazardous materials, any of the circumstances set forth in § 171.15(a) occurs or there has been an unintentional release of hazardous materials from a package (including a tank) or any quantity of hazardous waste has been discharged during transportation. If a report pertains to a hazardous waste discharge:

(1) A copy of the hazardous waste manifest for the waste must be attached to the report, and

(2) An estimate of the quantity of the waste removed from the scene, the name and address of the facility to which it was taken, and the manner of disposition of any unremoved waste, must be entered in Part H of the report (Form F 5800.1).

(b) Each carrier making a report under this section shall send that report to the Information Systems Manager, Research and Special Programs Administration, Department of Transportation, Washington, D.C. 20590.

(c) Except as provided in paragraph (d) of this section, the requirements of paragraph (a) of this section do not apply to incidents involving the unintentional release of hazardous materials being transported under the following proper shipping names:

(1) Consumer commodity.

(2) Battery, *electric storage*, wet, filled with acid *or* alkali.

(3) Paint and paint related material when shipped in packagings of five gallons or less.

(d) The exceptions to incident reporting provided in paragraph (c) of this section do not apply to:

(1) Incidents required to be reported under § 171.15(a);

(2) Incidents involving transportation aboard aircraft; nor

(3) Incidents involving the transportation of hazardous waste.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 171-7, 35 FR 16837, Oct. 3, 1970, as amended by Amdt. 171-56, 45 FR 73683, Nov. 6, 1980; Amdt. 171-57, 45 FR 80829, Dec. 8, 1980; Amdt. No. 171-65, 47 FR 24584, June 7, 1982; Amdt. 171-66, 47 FR 43064, Sept. 30, 1982; Amdt. 171-72, 48 FR 17095, Apr. 21, 1983]

§ 171.17 Hazardous substance discharge notification.

(a) When a hazardous substance is discharged in a reportable quantity from one package or transport vehicle if not packaged (accidentally or intentionally) into or upon the navigable waters or adjoining shorelines, the person in charge of the aircraft, vessel, transport vehicle or facility shall, as soon as that person has knowledge of such discharge, notify directly, or indirectly through the carrier, the U.S. Coast Guard National Response Center at (toll free) 800-424-8802, or (toll call) 202-426-2675, and furnish the official to whom the discharge notification is made:

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[1] Filed as part of the original document.

(1) The information required by § 171.15.

(2) The name of the shipper of the hazardous substance, and

(3) The quantity of the hazardous substance discharged, if known.

(b) If the person in charge of the aircraft, vessel, transport, vehicle or facility is incapacitated or otherwise unable to make the notification required by this section, the carrier shall make the notification.

(c) An estimate of the quantity of the hazardous substance removed from the scene and the manner of disposition of any unremoved hazardous substance shall be entered in Part H of the report required by § 171.16 of this part.

[Amdt. 171-53, 45 FR 34587, May 22, 1980, as amended by Amdt. 171-53, 45 FR 74648, Nov. 10, 1980]

§ 171.18 Continuation of effectiveness of existing Bureau of Explosives registrations.

A registration filed with the Bureau of Explosives in compliance with a requirement of the subchapter, which is valid at the time that registration function is assumed by RSPA remains valid to the same extent as if it had been filed originally with RSPA.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 171-50, 44 FR 55577, Sept. 27, 1979]

§ 171.19 Approvals or authorizations issued by the Bureau of Explosives.

Unless otherwise specifically restricted by other requirements of this subchapter, any written approval or authorization issued by the Bureau of Explosives that is valid at the time the Bureau of Explosives authority to issue that approval or authorization is withdrawn or assumed by the Director, OHMT and which is available for inspection by representatives of the Department of Transportation, will be considered as having the same validity as if issued by the Director, OHMT, and remains valid under the conditions and for the period established by the Bureau of Explosives.

(49 U.S.C. 1803, 1804, 1808, and 1809; 49 CFR 1.53, App. A to Part 1)

[Amdt. 171-70, 48 FR 2655, Jan. 20, 1983]

§ 171.20 Submission of Examination Reports.

(a) When it is required in this subchapter that the issuance of an approval by the Director, OHMT be based on an examination by the Bureau of Explosives (or any other test facility recognized by RSPA), it is the responsibility of the applicant to submit the results of the examination to the Director, OHMT.

(b) Applications for approval submitted under paragraph (a) of this section, must be submitted to the Director, Office of Hazardous Materials Transportation, Research and Special Programs Administration, Washington, D.C. 20590.

(c) Any applicant for an approval aggrieved by an action taken by the Director, OHMT, under this subpart may file an appeal with the Administrator, RSPA within 30 days of service of notification of a denial.

[Amdt. 171-54, 45 FR 32692, May 19, 1980, as amended by Amdt. 171-66, 47 FR 43064, Sept. 30, 1982]

PART 172—HAZARDOUS MATERIALS TABLES AND HAZARDOUS MATERIALS COMMUNICATIONS REGULATIONS

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APPENDIX B—DIMENSIONAL SPECIFICATION FOR PLACARDS

APPENDIX C—DIMENSIONAL SPECIFICATIONS FOR RECOMMENDED PLACARD HOLDER

AUTHORITY: 49 U.S.C. 1803, 1804; 49 CFR 1.53(e), unless otherwise noted.

SOURCE: Amdt. 172-29, 41 FR 15996, Apr. 15, 1976, unless otherwise noted.

Subpart A—General

§ 172.1 Purpose and scope.

This part lists and classifies those materials which the Department of Transportation has designated as hazardous materials for purposes of transportation and prescribes the requirements for shipping papers, package marking, labeling, and transport vehicle placarding applicable to the shipment and transportation of those hazardous materials.

[Amdt. 172-29, 41 FR 15997, Apr. 15, 1976]

§ 172.3 Applicability.

(a) This part applies to—(1) Each person who offers a hazardous material for transportation, and

(2) Each carrier by air, highway, rail, or water who transports a hazardous material.

(b) When a person, other than one of those provided for in paragraph (a) of this section, performs a packaging labeling or marking function required by this part, that person shall perform the function in accordance with this part.

[Amdt. 172-29, 41 FR 15996, Apr. 15, 1976, as amended by Amdt. 172-32, 41 FR 38179, Sept. 9, 1976]

Subpart B—Tables of Hazardous Materials, Their Description, Proper Shipping Name, Class, Label, Packaging, and Other Requirements

§ 172.101 Purpose and use of hazardous materials table.

(a) The Hazardous Materials Table (Table) in this section designates the materials listed therein as hazardous materials for the purpose of transportation of those materials in commerce. The Table identifies the class of each listed material, and specifies or references requirements in this subchapter pertaining to its packaging, labeling, and transportation. However, those references do not include other requirements having general applicability such as those specified in Parts 171 and 172, and Subparts A and B of Part 173, of this subchapter.

(b) Column 1 contains the four symbols as appropriate: Plus (+) and the letters "A", "W", and "E".

(1) The plus (+) fixes the proper shipping name and the hazard class for that entry without regard to whether the material meets the definition of that class. An alternate proper shipping name and hazard class may be authorized by the Director, Office of Hazardous Materials Transportation, RSPA.

(2) A letter "A" restricts the application of this subchapter to materials offered or intended for transportation by aircraft unless:

(i) A letter "E" also appears with it and the material is a hazardous substance; or

(ii) The material is a hazardous waste.

(3) A letter "W" restricts the application of this subchapter to materials offered or intended for transportation by vessel unless:

(i) A letter "E" also appears with it and the material is a hazardous substance; or

(ii) The material is a hazardous waste.

(4) A letter "E" identifies materials which are subject to the requirements of this subchapter, regardless of the mode of transportation or hazard class, if it is a hazardous substance (as defined in § 171.8 of this subchapter). A hazardous substance which does not meet the defining criteria for another hazard class remains subject to certain requirements of this subchapter as an ORM-E.

(c) Column 2 lists the proper shipping name of materials designated as hazardous materials. Modification of a proper shipping name may otherwise be required or authorized by this section (see paragraphs (b)(4), (c)(10), (c)(11), (c)(12) and (c)(13) of this section). Proper shipping names are limited to those shown in Roman type (not italics).

(1) Shipping names may be used in the singular or plural and in either capital or lower case letters.

(2) The words in italics are not part of the proper shipping name but may be used in addition to the proper shipping name. The word "or" in italics indicates that any terms in the sequence

may be used as the proper shipping name as appropriate.

(3) The abbreviation "n.o.i.", which means "not otherwise indexed", or "n.o.i.b.n.", which means "not otherwise indexed by name", may be used interchangeably with "n.o.s.".

(4) Except for hazardous wastes, when qualifying words are used as part of proper shipping name, their sequence on the package markings and shipping paper descriptions is optional. However, the entry in the Table reflects the preferred sequence.

(5) Except for organic peroxides, when one entry references another entry by use of the word "*see*", if both names are in Roman type, either name may be used as the proper shipping name (e.g., Carbolic acid. *See* Phenol).

For an organic peroxide, the technical name shall be used as the proper shipping name.

(6) The words "poison" or "poisonous" in this column refer to materials that would cause death by systemic poisoning rather than by corrosive destruction of tissue.

(7) When a shipping name includes a concentration range as part of the shipping description, the actual concentration being shipped, if it is within the range stated, may be used in place of the concentration range. For example, a hydrogen peroxide solution containing 30% peroxide may be shipped as either "Hydrogen peroxide solution (8% to 40% peroxide)" or "Hydrogen peroxide solution, 30% peroxide".

(8) The use of the prefix "mono" is optional in any shipping name when appropriate. Thus, Monoethanolamine may be used interchangeably with Ethanolamine. In "Difluoromonochloroethane" the term "mono" is considered to be a prefix to the term "chloroethane" and may be deleted.

(9) The numbers in italics following a proper shipping name of a material identified by the letter "E" in Column 1 specify, in pounds and kilograms, the minimum quantity of the material that constitutes a reportable quantity, excluding water and other formulating materials. For example: Ammonia solution (*RQ-1000/454*) means that the reportable quantity for the Ammonia is 1,000 pounds or 454 kilograms. Any formulating material that is identified by the letter "E" in Column 1 of the Table to § 172.101 and used in a mixture or solution must be evaluated independently for the RQ determination. For example, if Mevinphos (*RQ-1/0.454*) is mixed with Xylene (*RQ-1000/454*) and is in a 10 lb. package described as "Organophosphorus pesticide, liquid, n.o.s.", Mevinphos could be in a reportable quantity, but there could not be a reportable quantity of the Xylene present in that package.

(10) If the word "waste" is not included in the hazardous material description in the Table, the proper shipping name for a hazardous waste must include the word "Waste" preceding the shipping name of the material. For example: Waste acetone.

(11) A mixture or solution comprised of a hazardous material identified in the Table by technical name and nonhazardous material may be described using the proper shipping name of the hazardous material, if:

(i) The mixture or solution is not specifically identified in the Table;

(ii) The hazard class of the mixture or solution is the same as that of the hazardous material, and

(iii) The qualifying word "mixture" or "solution", as appropriate, is added as part of the proper shipping name.

For example, a solution of Acetone, mineral oil, and water, meeting the definition of a flammable liquid, may be described under this optional provision as "Acetone solution. Flammable liquid UN 1090."

(12) A material for which the hazard class is to be determined by testing or a material that is a hazardous waste may be assigned a tentative shipping name, hazard class and identification number, based on the shipper's tentative determination according to:

(i) Defining criteria in this subchapter;

(ii) The hazard precedence prescribed in § 173.2 of this subchapter; and

(iii) The shipper's knowledge of the material.

This paragraph does not apply to a material subject to or prohibited by §§ 173.21 173.51, 173.86(d), 173.86(e)(1), and 173.114a(g)(2) of this subchapter.

(13) Except for proper shipping names in the Table that are preceded by a plus (+):

(i) If it is specifically determined that a material meets the definition of a hazard class other than the class shown in association with the proper shipping name, the material must be described by an appropriate shipping name listed in association with the correct class for the material or:

(ii) If an appropriate technical name is not shown in the Table, selection of a proper shipping name must be made from the general descriptions or n.o.s. entries corresponding to the specific hazard class of the material being shipped. The name that most appropriately describes the material must be used e.g., an alcohol not listed by name in the Table must be shipped as "Alcohol, n.o.s." rather than "Flammable liquid, n.o.s." Some mixtures may be more appropriately described according to their application, such as "Compound, cleaning, liquid" or "Compound rust removing," rather than by an n.o.s. entry, such as "Corrosive liquid, n.o.s."

(iii) If a material meets the definition of more than one hazard class, and is not specifically identified in the Table, the hazard class of the material must be determined by using the precedence specified in § 173.2 of this subchapter, and an appropriate shipping description must be selected as described in paragraph (c)(13)(ii) of this section.

(iv) If it is specifically determined that a material is not a forbidden material and does not meet the definition of any hazard class, the material is not a hazardous material.

(d) Column 3 contains a designation of the hazard class corresponding to each proper shipping name, or the word "Forbidden".

(1) A material for which the entry in this column is "Forbidden" is prohibited from being offered or accepted for transportation. This prohibition does not apply if these materials are diluted, stabilized, or incorporated in devices and they are classed in accordance with the definitions of hazardous materials contained in Part 173 of this subchapter.

(2) When re-evaluation of test data or new data indicates a need to modify the "Forbidden" designation or the hazard class specified for a material specifically identified in the Table, this data should be submitted to the Director, Office of Hazardous Materials Transportation, RSPA.

(3) Notwithstanding the ORM class shown for a material in Column 3, such a material having a flash point of 100°F. to 200°F. is classed as Combustible liquid when in a packaging having a rated capacity of more than 110 gallons.

(e) Column 3(a) lists the identification numbers assigned to hazardous materials. Those preceded by a "UN" are associated with descriptions considered appropriate for international shipments as well as domestic shipments. Those preceded by an "NA" are associated with descriptions that are not recognized for international shipments, except to and from Canada. If an identification number is in the "NA9000" series, it is either associated with the description of a material that is not appropriately covered by international hazardous materials (dangerous goods) shipping standards or not appropriately addressed by such standards for emergency response information purposes, except for transportation between the United States and Canada.

(f) Column 4 specifies the labels required to be applied to each package, subject to the additional labeling requirements in § 172.402.

(g) Column 5 references the applicable packaging section of Part 173 of this subchapter. Exceptions from some of the requirements of this subchapter are noted in column 5(a); others are contained in §§ 171.3, 173.3, 173.4, and 173.5 of this subchapter in addition to those contained in Parts 174, 175, 176, and 177 of this subchapter. References to specific packaging requirements and certain additional exceptions are noted in column 5(b).

(1) Each reference to a section in Column 5(b) for an ORM A, B, or C that is a hazardous waste or a hazardous substance is modified to read § 173.510 if the section referenced is applicable only to a particular mode (or modes) and the material is trans-

ported by a mode not addressed in the section.

(h) Column 6 specifies the maximum net quantity in one package for transportation by aircraft or passenger railcar. In this column, "Forbidden" means the material may not be offered or carried and is limited in its applicability only to the types of transportation covered by the column. In addition, an exception for certain flammable liquids is provided in § 173.118 of this subchapter.

(1) Column 6(a) specifies the maximum net quantity permitted in one package for transportation by passenger-carrying aircraft or passenger railcar. For transportation by aircraft, any material forbidden on passenger-carrying aircraft but permitted on cargo aircraft, or which exceeds the maximum quantity authorized on passenger-carrying aircraft, must be shipped by cargo-only aircraft and bear the CARGO AIRCRAFT ONLY label as described in § 172.448.

(2) Column 6(b) specifies the maximum net quantity permitted in one package for transportation by cargo-only aircraft. When offered for transportation by aircraft, a package must bear the CARGO AIRCRAFT ONLY label when the quantity of hazardous material in one package exceeds that authorized on passenger-carrying aircraft, or is forbidden on passenger-carrying aircraft.

(i) Column 7 specifies each of the authorized locations on board cargo vessels and passenger vessels and certain additional requirements for shipments of each listed hazardous material. Section 176.63 of this subchapter sets forth the physical requirements for each of the authorized locations listed in Column 7. (For bulk shipments by vessel see 46 CFR Parts 30 to 40, 70, 98, 148, 151, 153, and 154.)

(1) "1" means the materials must be stowed "on deck" subject to the requirements of § 176.63(b) of this subchapter. When both "on deck" and "under deck" are authorized, "under deck" should be used if available.

(2) "1,2" means the material must be stowed either "on deck" or "under deck"; however, "under deck" should be used if available.

(3) "1,3" means the material must be stowed either "on deck" or "under deck away from heat"; however, "under deck away from heat" stowage should be used if it is available.

(4) "2" means the material must be stowed "under deck" in a compartment or hold subject to the requirements of § 176.63(c). When both "on deck" and "under deck" are authorized, "under deck" should be used if available.

(5) "3" means the material must be stowed "under deck away from heat" in a ventilated compartment or hold subject to the requirements of § 176.63(d) of this subchapter.

(6) "4" means the material is authorized to be transported in only the limited quantities specified in the CFR section listed in column 5 and is subject to the stowage requirements specified for a cargo vessel for the same material.

(7) "5" means the material is forbidden and may not be offered or accepted for transportation.

(8) "6" means the material is authorized to be transported in a magazine subject to the requirements of §§ 176.135 through 176.144 of this subchapter.

(j) Unless specifically stated otherwise in the amendement or the "Effective date" entry in its preamble, if any entry in this Table is changed by an amendment to this subchapter:

(1) Such a change does not apply to the shipment of any package filled prior to the effective date of the amendment; and

(2) Stocks of preprinted shipping papers and package markings may be continued in use, in the manner previously authorized, until depleted or for a one year period, whichever is less.

Hazardous Materials Table

(1)	(2)	(3)	(3A)	(4)	(5) Packaging		(6) Maximum net quantity in one package		(7) Water shipments		
+/ E/ A/ W	Hazardous materials descriptions and proper shipping names	Hazard class	Identification number	Label(s) required (if not excepted)	(a) Exceptions	(b) Specific requirements	(a) Passenger carrying aircraft or railcar	(b) Cargo aircraft only	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Accumulator, pressurized *(pneumatic or hydraulic), containing nonflammable gas*	Nonflammable gas	NA1956	Nonflammable gas	173.306		No limit	No limit	1,2	1,2	
	Acetal	Flammable liquid	UN1088	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,3	4	
E	Acetaldehyde (*ethyl aldehyde*) (*RQ-1000/454*)	Flammable liquid	UN1089	Flammable liquid	None	173.119	Forbidden	10 gallons	1,3	5	
EA	Acetaldehyde ammonia (*RQ-1000/454*)	ORM-A	UN1841	None	173.505	173.510	No limit	No limit	1,2	1,2	
E	Acetic acid (*aqueous solution*) (*RQ-1000/454*)	Corrosive material	UN2790	Corrosive	173.244	173.245	1 quart	10 gallons	1,2	1,2	Stow separate from nitric acid or oxidizing materials
E	Acetic acid, glacial (*RQ-1000/454*)	Corrosive material	UN2789	Corrosive	173.244	173.245	1 quart	10 gallons	1,2	1,2	Stow separate from nitric acid or oxidizing materials
E	Acetic anhydride (*RQ-1000/454*)	Corrosive material	UN1715	Corrosive	173.244	173.245	1 quart	1 gallon	1,2	1,2	
	Acetone	Flammable liquid	UN1090	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,3	4	
E	Acetone cyanohydrin (*RQ-10/4.54*)	Poison B	UN1541	Poison	None	173.346 173.3a	Forbidden	55 gallons	1	5	Shade from radiant heat. Stow away from corrosive materials
	Acetone oil	Flammable liquid	UN1091	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Acetonitrile	Flammable liquid	NA1648	Flammable liquid	173.118	173.119	1 quart	10 gallons	1	4	Shade from radiant heat
	Acetyl acetone peroxide, *in solution with not more than 9% by weight active oxygen. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2080								
	Acetyl acetone peroxide with more than 9% by weight active oxygen	Forbidden									
	Acetyl benzoyl peroxide, *not more than 40% in solution. See* Acetyl benzoyl peroxide solution, *not over 40% peroxide*		UN2081								
	Acetyl benzoyl peroxide, solid, or more than 40% in solution	Forbidden									
	Acetyl benzoyl peroxide solution, *not over 40% peroxide*	Organic peroxide	UN2081	Organic peroxide	None	173.222	Forbidden	1 quart	1,2	1	
E	Acetyl bromide (*RQ-5000/2270*)	Corrosive material	UN1716	Corrosive	173.244	173.247	1 quart	1 gallon	1	1	Keep dry. Glass carboys not permitted on passenger vessels
E	Acetyl chloride (*RQ-5000/2270*)	Flammable liquid	UN1717	Flammable liquid	173.244	173.247	1 quart	1 gallon	1	1	Stow away from alcohols. Keep cool and dry. Separate longitudinally by an intervening complete compartment or hold from explosives

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Hazardous Materials Table—Continued

(1)	(2)	(3)	(3A)	(4)	(5) Packaging		(6) Maximum net quantity in one package		(7) Water shipments		
+/ E/ A/ W	Hazardous materials descriptions and proper shipping names	Hazard class	Identification number	Label(s) required (if not excepted)	(a) Exceptions	(b) Specific requirements	(a) Passenger carrying aircraft or railcar	(b) Cargo aircraft only	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Acetyl cyclohexanesulfonyl peroxide, more than 82%, wetted with less than 12% water	Forbidden									
	Acetyl cyclohexanesulphonyl peroxide, *not more than 82%, wetted with not less than 12% water. See* Organic peroxide, solid, n.o.s.		UN2082								
	Acetyl cyclohexanesulphonyl peroxide, *not more than 32% in solution. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2083								
	Acetylene	Flammable gas	UN1001	Flammable gas	None	173.303	Forbidden	300 pounds	1	1	Shade from radiant heat
	Acetylene (liquid)	Forbidden									
	Acetylene silver nitrate	Forbidden									
A	Acetylene tetrabromide	ORM-A	UN2504	None	173.505	173.510	10 gallons	55 gallons			
	Acetyl iodide	Corrosive material	UN1898	Corrosive	173.244	173.247	1 quart	1 gallon	1	1	Keep dry. Glass carboys not permitted on passenger vessels
	Acetyl peroxide, *not more than 25% in solution. See* Acetyl peroxide solution, *not over 25% peroxide*		UN2084								
	Acetyl peroxide, solid, or more than 25% in solution	Forbidden									
	Acetyl peroxide solution, *not over 25% peroxide*	Organic peroxide	UN2084	Organic peroxide	173.153	173.222	Forbidden	1 quart	1,2	1	
	Acid butyl phosphate	Corrosive material	UN1718	Corrosive	173.244	173.245	1 quart	5 gallons	1,2	1,2	Glass carboys in hampers not permitted under deck
	Acid carboy, empty. *See* Carboy, empty.										
	Acid, liquid, n.o.s.	Corrosive material	NA1760	Corrosive	173.244	173.245	1 quart	5 pints	1	4	Keep cool
+E	Acrolein, inhibited (*RQ-1/.454*)	Flammable liquid	UN1092	Flammable liquid and Poison	None	173.122	Forbidden	1 quart	1,2	5	Keep cool. Stow away from living quarters
	Acrylic acid	Corrosive material	UN2218	Corrosive	173.244	173.245	1 quart	5 pints	1	1	
E	Acrylonitrile (*RQ-100/45.4*)	Flammable liquid	UN1093	Flammable liquid and Poison	None	173.119	Forbidden	1 quart	1,2	5	Keep cool
	Actuating cartridge, explosive (*fire extinguisher, or valve*)	Class C explosive		Explosive C	173.114		50 pounds	150 pounds	1,2	1,2	Keep cool and dry
	Adhesive	Combustible liquid	UN1133	None	173.118a	None	No limit	No limit	1,2	1,2	

	Adhesive	Flammable liquid	UN1133	Flammable liquid	173.118	173.132	1 quart	10 gallons	1,2	1	
E	**Adipic acid (*RQ-5000/2270*)**	ORM-E	NA9077	None	None	173.510	No limit	No limit	1,2	1,2	
	Aerosol product. See Compressed gas, n.o.s.										
	Air, compressed	Nonflammable gas	UN1002	Nonflammable gas	173.306	173.302	150 pounds	300 pounds	1,2	1,2	
	Air conditioning machine. *See* Refrigerating machine										
	Airplane flare. See Fireworks, special										
	Alcoholic beverage	Flammable liquid	UN1170	Flammable liquid	173.118	173.125	See 173.118(C)	10 gallons	1,2	1	
	Alcoholic beverage	Combustible liquid	UN1170	None	173.118a	None	No limit	No limit	1,2	1,2	
	Alcohol, n.o.s.	Flammable liquid	UN1987	Flammable liquid	173.118	173.125	1 quart	10 gallons	1,2	1	
	Alcohol, n.o.s.	Combustible liquid	UN1987	None	173.118a	None	No limit	No limit	1,2	1,2	
E	Aldrin (*RQ-1/0.454*)	Poison B	NA2761	Poison	173.364	173.376	50 pounds	200 pounds	1,2	1,2	
EA	Aldrin, cast solid (*RQ-1/0.454*)	ORM-A	NA2761	None	173.505	173.510	No limit	No limit	1,2	1,2	
E	Aldrin mixture, dry (*with more than 65% aldrin*) (*RQ-1/0.454*)	Poison B	NA2761	Poison	173.364	173.376	50 pounds	200 pounds	1,2	1,2	
EA	Aldrin mixture, dry, with 65% or less aldrin (*RQ-1/0.454*)	ORM-A	NA2761	None	173.505	173.510	No limit	No limit	1,2	1,2	
E	Aldrin mixture, liquid (*with more than 60% aldrin*) (*RQ-1/0.454*)	Poison B	NA2762	Poison	173.345	173.361	1 quart	55 gallons	1,2	1,2	If flash point less than 141 deg F, segregation same as for flammable liquids
EA	Aldrin mixture, liquid, with 60% or less aldrin (*RQ-1/0.454*)	ORM-A	NA2762	None	173.505	173.510	No limit	No limit	1,2	1,2	
	Alkaline *(corrosive)* liquid, n.o.s.	Corrosive material	NA1719	Corrosive	173.244	173.249	1 quart	5 gallons	1,2	1,2	
	Alkanesulfonic acid	Corrosive material	UN2584	Corrosive	173.244	173.245	5 pints	1 gallon	1,2	1	
	Alkyl aluminum halides. See Pyrophoric liquid, n.o.s.										
A	Allethrin	ORM-A	NA2902	None	173.505	173.510	No limit	No limit			
E	Allyl alcohol *(RQ-100/45.4)*	Flammable liquid	UN1098	Flammable liquid and Poison	None	173.119 173.3a	1 quart	10 gallons	1,2	1	
	Allyl bromide	Flammable liquid	UN1099	Flammable liquid	173.118	173.119	Forbidden	10 gallons	1,2	1	
E	Allyl chloride (*RQ-1000/454*)	Flammable liquid	UN1100	Flammable liquid	None	173.119	Forbidden	10 gallons	1,3	5	
	Allyl chlorocarbonate	Flammable liquid	UN1722	Flammable liquid	None	173.288	Forbidden	5 pints	1	5	Keep dry. Separate longitudinally by an intervening complete hold or compartment from explosives. Segregation same as for corrosive materials
	Allyl chloroformate. *See* Allyl chlorocarbonate										
	Allyl trichlorosilane	Corrosive material	UN1724	Corrosive	None	173.280	Forbidden	10 gallons	1	1	Keep dry
	Aluminum alkyl. *See* Pyrophoric liquid, n.o.s.										
	Aluminum bromide, anhydrous	Corrosive material	UN1725	Corrosive	173.244	173.245b	25 pounds	100 pounds	1,2	1,2	Keep dry
	Aluminum chloride, anhydrous	Corrosive material	UN1726	Corrosive	173.244	173.245b	25 pounds	100 pounds	1,2	1,2	Keep dry
	Aluminum dross, wet or hot. See 173.173	Forbidden									

Hazardous Materials Table—Continued

(1)	(2)	(3)	(3A)	(4)	(5) Packaging		(6) Maximum net quantity in one package		(7) Water shipments		
+/ E/ A/ W	Hazardous materials descriptions and proper shipping names	Hazard class	Identification number	Label(s) required (if not excepted)	(a) Exceptions	(b) Specific requirements	(a) Passenger carrying aircraft or railcar	(b) Cargo aircraft only	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Aluminum hydride	Flammable solid	UN2463	Flammable solid and Dangerous when wet	None	173.206	Forbidden	25 pounds	1,2	5	Segregation same as for flammable solid labeled Dangerous When Wet
	Aluminum, metallic, powder	Flammable solid	UN1396	Flammable solid	173.232	173.232	25 pounds	100 pounds	1,2	1,2	Keep dry. Segregation same as for flammable solids labeled dangerous when wet
	Aluminum nitrate	Oxidizer	UN1438	Oxidizer	173.153	173.182	25 pounds	100 pounds	1,2	1,2	
	Aluminum phosphate solution	Corrosive material	NA1760	Corrosive	173.244	173.245	1 quart	10 gallons	1,2	1,2	
	Aluminum phosphide	Flammable solid	UN1397	Flammable solid and Dangerous when wet	None	173.154	Forbidden	25 pounds	1,2	1,2	Stow away from acids and oxidizing materials
E	**Aluminum sulfate, solid (*RQ-5000/2270*)**	ORM-E	NA9078	None	None	173.510	No limit	No limit	1,2	1,2	
EA	**Aluminum sulfate solution (*RQ-5000/2270*)**	ORM-B	NA1760	None	173.505	173.510	25 pounds	100 pounds	1,2	1,2	
	Amatol. See **High explosive**										
	2-(2-Aminoethoxy) ethanol	Corrosive material	NA1760	Corrosive	173.244	173.245	1 quart	10 gallons	1,2	1,2	
	N-Aminoethylpiperazine	Corrosive material	UN2815	Corrosive	173.244	173.245	1 quart	10 gallons	1,2	1,2	
	Aminopropyldiethanolamine	Corrosive material	NA1760	Corrosive	173.244	173.245	1 quart	10 gallons	1,2	1,2	
	N-Aminopropylmorpholine	Corrosive material	NA1760	Corrosive	173.244	173.245	1 quart	10 gallons	1,2	1,2	
	bis (Aminopropyl) piperazine	Corrosive material	NA1760	Corrosive	173.244	173.245	1 quart	10 gallons	1,2	1,2	
E	**Ammonia, anhydrous (*RQ-100/45.4*)**	Nonflammable gas	UN1005	Nonflammable gas	173.306	173.304 173.314 173.315	Forbidden	300 pounds	1,2	4	Stow in well ventilated space
E	**Ammonia solution (*containing more than 44% ammonia*) (*RQ-1000/454*)**	Nonflammable gas	UN2073	Nonflammable gas	173.306	173.304 173.314 173.315	Forbidden	300 pounds	1,2	4	Stow in well ventilated space
	Ammonia solution (containing 44% or less ammonia in water). See **Ammonium hydroxide**										
E	**Ammonium acetate (*RQ-5000/2270*)**	ORM-E	NA9079	None	None	173.510	No limit	No limit	1,2	1,2	
	Ammonium arsenate, solid	Poison B	UN1546	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	Stow away from alkaline corrosives
	Ammonium azide	Forbidden									
E	**Ammonium benzoate (*RQ-5000/2270*)**	ORM-E	NA9080	None	None	173.510	No limit	No limit	1,2	1,2	
E	**Ammonium bicarbonate (*RQ-5000/2270*)**	ORM-E	NA9081	None	None	173.510	No limit	No limit	1,2	1,2	

E	Ammonium bifluoride, solid *or* solution *See* Ammonium hydrogen fluoride, solid *or* solution										
EA	Ammonium bisulfite, solid (*RQ-5000/2270*)	ORM-B	NA2693	None	173.505	173.510	25 pounds	100 pounds	1,2	1,2	
E	Ammonium bisulfite solution (*RQ-5000/2270*)	Corrosive material	NA2693	Corrosive	173.244	173.245	1 quart	5 gallons	1,2	1,2	
	Ammonium bromate	Forbidden									
EA	Ammonium carbamate (*RQ-5000/2270*)	ORM-A	NA9083	None	173.505	173.510	50 pounds	No limit	1,2	1,2	Keep away from heat
EA	Ammonium carbonate (*RQ-5000/2270*)	ORM-A	NA9084	None	173.505	173.510	50 pounds	No limit	1,2	1,2	Keep away from heat, acids, alum and salts of iron or zinc
	Ammonium chlorate	Forbidden									
E	Ammonium chloride (*RQ-5000/2270*)	ORM-E	NA9085	None	None	173.510	No limit	No limit	1,2	1,2	
E	Ammonium chromate (*RQ-1000/454*)	ORM-E	NA9086	None	None	173.510	No limit	No limit	1,2	1,2	
E	Ammonium citrate, dibasic (*RQ-5000/2270*)	ORM-E	NA9087	None	None	173.510	No limit	No limit	1,2	1,2	
E	Ammonium dichromate (*ammonium bichromate*) (*RQ-1000/454*)	Oxidizer	UN1439	Oxidizer	173.153	173.154 173.235	25 pounds	100 pounds	1,2	1,2	
EA	Ammonium fluoborate (*RQ-5000/2270*)	ORM-B	NA9088	None	None	173.510	25 pounds	100 pounds	1,2	1,2	
EA	Ammonium fluoride (*RQ-5000/2270*)	ORM-B	UN2505	None	173.505	173.800	25 pounds	100 pounds	1,2	1,2	
	Ammonium fulminate	Forbidden									
E	Ammonium hydrogen fluoride, solid (*RQ-5000/2270*)	Corrosive material	UN1727	Corrosive	173.244	173.245b	25 pounds	100 pounds	1,2	1,2	Keep dry
E	Ammonium hydrogen fluoride solution (*RQ-5000/2270*)	Corrosive material	UN2817	Corrosive	173.244	173.245	1 quart	5 gallons	1,2	1,2	Keep dry
A	Ammonium hydrogen sulfate	ORM-B	UN2506	None	173.505	173.800	25 pounds	100 pounds			
A	Ammonium hydrosulfide solution	ORM-A	NA2683	None	173.505	173.605	10 gallons	55 gallons			
E	Ammonium hydroxide (*containing notless than 12% but not more than 44% ammonia*) (*RQ-1000/454*)	Corrosive material	NA2672	Corrosive	173.244	173.245	2 gallons	2 gallons	1	4	
EAW	Ammonium hydroxide (*containing less than 12% ammonia*) (*RQ-1000/454*)	ORM-A	NA2672	None	173.505	173.510	10 gallons	55 gallons	1	1	
	Ammonium nitrate-carbonate mixture	Oxidizer	UN2068	Oxidizer	173.153	173.182	25 pounds	100 pounds	1,2	1,2	
	Ammonium nitrate fertilizer, *containing no more than 0.2% carbon*	Oxidizer	UN2067	Oxidizer	173.153	173.182	25 pounds	100 pounds	1,2	1,2	
	Ammonium nitrate - fuel oil mixture. See High explosive										
	Ammonium nitrate-fuel oil mixture *(containing only prilled ammonium nitrate and fuel oil)*	Blasting agent		Blasting agent	None	173.114a	Fordidden	100pounds	1,2	1,2	
	Ammonium nitrate mixed fertilizer	Oxidizer	UN2069	Oxidizer	173.153	173.182	25 pounds	100 pounds	1,2	1,2	
	Ammonium nitrate (no organic coating)	Oxidizer	UN1942	Oxidizer	173.153	173.182	25 pounds	100 pounds	1,2	1,2	
	Ammonium nitrate (organic coating)	Oxidizer	NA1942	Oxidizer	173.153	173.182	25 pounds	100 pounds	1,2	1,2	
	Ammonium nitrate-phosphate	Oxidizer	UN2070	Oxidizer	173.153	173.182	25 pounds	100 pounds	1,2	1,2	
	Ammonium nitrate, solution (*containing not less than 15% water*). *See 173.154(a)(17) and 173.154(a)(18)*	Oxidizer	UN2426	Oxidizer							
	Ammonium nitrite	Forbidden									
E	Ammonium oxalate (*RQ-5000/2270*)	ORM-A	NA2449	None	173.505	173.510	50 pounds	200 pounds	1,2	1,2	
	Ammonium perchlorate	Oxidizer	UN1442	Oxidizer	173.153	173.239a	25 pounds	100 pounds	1,2	4	Stow away from powdered metals
	Ammonium perchlorate. *See* High explosive										
	Ammonium permanganate	Oxidizer	NA9190	Oxidizer	None	173.154	Forbidden	Forbidden	1,2	1,2	Separate from ammonium compounds and hydrogen peroxide. This material may be forbidden in water transportation by certain countries
	Ammonium persulfate	Oxidizer	UN1444	Oxidizer	173.153	173.154	50 pounds	200 pounds	1,2	1,2	
	Ammonium picrate, dry. See High explosive										

Hazardous Materials Table—Continued

(1)	(2)	(3)	(3A)	(4)	(5) Packaging		(6) Maximum net quantity in one package		(7) Water shipments		
+ E A W	Hazardous materials descriptions and proper shipping names	Hazard class	Identification number	Label(s) required (if not excepted)	(a) Exceptions	(b) Specific requirements	(a) Passenger carrying aircraft or railcar	(b) Cargo aircraft only	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Ammonium picrate, wet *(with 10% or more water)*	Flammable solid	UN1310	Flammable solid	173.192		1 pound	1 pound	1	4	Stow away from heavy metals and their compounds
	Ammonium picrate, wet, with 10% or more water, over 16 ounces in one outside packaging. See High explosive										
A	Ammonium polysulfide solution	ORM-A	UN2818	None	173.505	173.605	10 gallons	55 gallons			
EA	Ammonium silicofluoride *(RQ-1000/454)*	ORM-B	UN2854	None	173.505	173.510	25 pounds	100 pounds	1,2	1,2	
E	Ammonium sulfamate *(RQ-5000/2270)*	ORM-E	NA9089	None	None	173.510	No limit	No limit	1,2	1,2	
W	Ammonium sulfate nitrate	ORM-C	NA1477	None	173.505	173.910			1,2	1,2	Must not be accepted for transportation while hot. Separate by an intervening hold or compartment from Class A explosives. Separate from other explosives, corrosive materials, flammable solids, liquids, or gases, oxidizing materials, organic peroxides, or organic materials
E	Ammonium sulfide solution *(RQ-5000/2270)*	Flammable liquid	UN2683	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1,2	
E	Ammonium sulfite *(RQ-5000/2270)*	ORM-E	NA9090	None	None	173.510	No limit	No limit	1,2	1,2	
E	Ammonium tartrate *(RQ-5000/2270)*	ORM-E	NA9091	None	None	173.510	No limit	No limit	1,2	1,2	
E	Ammonium thiocyanate *(RQ-5000/2270)*	ORM-E	NA9092	None	None	173.510	No limit	No limit	1,2	1,2	
E	Ammonium thiosulfate *(RQ-5000/2270)*	ORM-E	NA9093	None	None	173.510	No limit	No limit	1,2	1,2	
	Ammunition, chemical (containing a Poison A liquid or gas). See Chemical ammunition, nonexplosive *(containing a Poison A material)*										
	Ammunition, chemical (containing a Poison B material). See Chemical ammunition, nonexplosive *(containing a Poison B material)*										
	Ammunition, chemical (containing an irritating liquid or solid). See Chemical ammunition, nonexplosive *(containing an irritating material)*										
	Ammunition, chemical, explosive, with Poison A material	Class A explosive		Explosive A and Poison gas	None	173.59	Forbidden	Forbidden	6	5	No other cargo may be stowed in the same hold with these items
	Ammunition, chemical, explosive, with Poison B material	Class A explosive		Explosive A and Poison	None	173.59	Forbidden	Forbidden	6	5	No other cargo may be stowed in the same hold with these items
	Ammunition, chemical, explosive, with irritant	Class A explosive		Explosive A and Irritant	None	173.59	Forbidden	Forbidden	6	5	No other cargo may be stowed in the same hold with these items

	Ammunition for cannon with empty projectile	Class B explosive		Explosive B	None	173.90	Forbidden	Forbidden	1,2	5	
	Ammunition for cannon with explosive projectile	Class A explosive		Explosive A	None	173.54	Forbidden	Forbidden	6	5	
	Ammunition for cannon with gas projectile	Class A explosive		Explosive A	None	173.54	Forbidden	Forbidden	6	5	
	Ammunition for cannon with illuminating projectile	Class A explosive		Explosive A	None	173.54	Forbidden	Forbidden	6	5	
	Ammunition for cannon with incendiary projectile	Class A explosive		Explosive A	None	173.54	Forbidden	Forbidden	6	5	
	Ammunition for cannon with inert loaded projectile	Class B explosive		Explosive B	None	173.90	Forbidden	Forbidden	1,2	5	
	Ammunition for cannon without projectile	Class B explosive		Explosive B	None	173.90	Forbidden	Forbidden	1,2	5	
	Ammunition for cannon with smoke projectile	Class A explosive		Explosive A	None	173.56	Forbidden	Forbidden	6	5	
	Ammunition for cannon with solid projectile	Class B explosive		Explosive B	None	173.90	Forbidden	Forbidden	1,2	5	
	Ammunition for cannon with tear gas projectile	Class A explosive		Explosive A	None	173.54	Forbidden	Forbidden	6	5	
	Ammunition for cannon with tear gas projectile	Class B explosive		Explosive B	None	173.90	Forbidden	Forbidden	1,2	5	
	Ammunition for small-arms with explosive projectile	Class A explosive		Explosive A	None	173.56	Forbidden	Forbidden	6	5	
	Ammunition for small-arms with incendiary projectile	Class A explosive		Explosive A	None	173.56	Forbidden	Forbidden	6	5	
	Ammunition, non-explosive. See 173.55										
	Ammunition, rocket. See Rocket ammunition with										
	Ammunition, small-arms. *See* Small-arms ammunition										
E	Amyl acetate (*RQ-1000/454*)	Flammable liquid	UN1104	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1,2	
	Amyl acid phosphate	Corrosive material	UN2819	Corrosive	173.244	173.245	1 quart	10 gallons	1,2	1,2	
	Amylamine	Flammable liquid	UN1106	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Amyl chloride	Flammable liquid	UN1107	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Amylene, *normal*	Flammable liquid	UN1108	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,3	1,3	
	Amyl formate	Flammable liquid	UN1109	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Amyl mercaptan	Flammable liquid	UN1111	Flammable liquid	None	173.141	Forbidden	10 gallons	1,2	1	
	Amyl nitrite	Flammable liquid	UN1113	Flammable liquid	173.118	173.119	1 quart	10gallons	1,5	4	
	tert-Amyl peroxy-2-ethylhexanoate, *technically pure. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2898								
	tert-Amyl peroxyneodecanoate, *not more than 75% with phlegmatizer. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2991								
	Amyl trichlorosilane	Corrosive material	UN1728	Corrosive	None	173.280	Forbidden	10 gallons	1	5	Keep dry
E	Anhydrous ammonia. *See* Ammonia, anhydrous										

Hazardous Materials Table—Continued

(1)	(2)	(3)	(3A)	(4)	(5) Packaging		(6) Maximum net quantity in one package		(7) Water shipments		
+ E A W	Hazardous materials descriptions and proper shipping names	Hazard class	Identification number	Label(s) required (if not excepted)	(a) Exceptions	(b) Specific requirements	(a) Passenger carrying aircraft or railcar	(b) Cargo aircraft only	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Anhydrous hydrazine *See* Hydrazine, anhydrous										
E	Anhydrous hydrofluoric acid *See* Hydrogen fluoride										
	Aniline oil drum, empty *See 173.347(d)*	Poison B							1,2	1	Do not accept unless returnable package notice is on drum and the instructions thereon have been carried out
+E	Aniline oil, liquid (*RQ-1000/454*)	Poison B	UN1547	Poison	None	173.347	Forbidden	55 gallons	1,2	1,2	Stow away from oxidizing materials and acids
	Anisoyl chloride	Corrosive material	UN1729	Corrosive	173.244	173.279	1 quart	1 quart	1	1	Keep dry
E	Antimonous chloride *See* Antimony trichloride										
A	Antimony lactate, solid	ORM-A	UN1550	None	173.505	173.510	No limit	No limit			
E	Antimony pentachloride (*RQ-1000/454*)	Corrosive material	UN1730	Corrosive	None	173.247	1 quart	1 quart	1	1	Keep dry. Glass carboys not permitted on passenger vessels
E	Antimony pentachloride solution (*RQ-1000/454*)	Corrosive material	UN1731	Corrosive	173.244	173.245	1 quart	5 pints	1	1	Keep dry. Glass carboys not permitted on passenger vessels
	Antimony pentafluoride	Corrosive material	UN1732	Corrosive	None	173.246	Forbidden	25 pounds	1	5	Keep dry
EA	Antimony potassium tartrate, solid (*RQ-1000/454*)	ORM-A	UN1551	None	173.505	173.510	No limit	No limit	1,2	1,2	
	Antimony sulfide and a chlorate, mixtures of	Forbidden									
A	Antimony sulfide, solid	ORM-A	NA1325	None	173.505	173.510	No limit	No limit			
E	Antimony tribromide, solid (*RQ-1000/454*)	Corrosive material	NA1549	Corrosive	173.244	173.245b	25 pounds	100 pounds	1,2	1,2	Keep dry
E	Antimony tribromide solution (*RQ-1000/454*)	Corrosive material	NA1549	Corrosive	173.244	173.245	1 quart	5 pints	1	1	Keep dry
E	Antimony trichloride, solid (*RQ-1000/454*)	Corrosive material	UN1733	Corrosive	173.244	173.245b	25 pounds	100 pounds	1,2	1,2	Keep dry
E	Antimony trichloride solution (*RQ-1000/454*)	Corrosive material	UN1733	Corrosive	173.244	173.245	1 quart	5 pints	1	1	Keep dry
E	Antimony trifluoride, solid (*RQ-1000/454*)	Corrosive material	NA1549	Corrosive	173.244	173.245b	25 pounds	100 pounds	1,2	1,2	Keep dry
E	Antimony trifluoride solution (*RQ-1000/454*)	Corrosive material	NA1549	Corrosive	173.244	173.245	1 quart	5 pints	1	1	Keep dry
E	Antimony trioxide (*RQ-5000/2270*)	ORM-E	NA9201	None	None	173.510	No limit	No limit	1,2	1,2	
E	Aqua ammonia solution (*containing 44% or less ammonia*) *See* Ammonium hydroxide										
	Argon *or* Argon, compressed	Nonflammable gas	UN1006	Nonflammable gas	173.306	173.302 173.314	150 pounds	300 pounds	1,2	1,3	

	Argon, refrigerated liquid *(cryogenic liquid)*	Nonflammable gas	UN1951	Nonflammable gas	173.320	173.316 173.318	100 pounds	1,100 pounds	1,3	1,3	
	Arsenic acid, solid	Poison B	UN1554	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
	Arsenic acid solution	Poison B	UN1553	Poison	173.345	173.346	1 quart	55 gallons	1,2	1,2	
	Arsenical compound, liquid, n.o.s., *or* Arsenical mixture, liquid, n.o.s.	Poison B	UN1556	Poison	173.345	173.346	1 quart	55 gallons	1,2	1,2	
	Arsenical compound, solid, n.o.s., *or* Arsenical mixture, solid, n.o.s.	Poison B	UN1557	Poison	173.364	173.367	50 pounds	200 pounds	1,2	1,2	Keep dry
	Arsenical dip, liquid *(sheep dip)*	Poison B	NA1557	Poison	173.345	173.346	1 quart	55 gallons	1,2	1,2	
	Arsenical dust	Poison B	UN1562	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
	Arsenical pesticide, liquid, n.o.s.*(compounds and preparations)*.	Flammable liquid	UN2760	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Arsenical pesticide, liquid, n.o.s.*(compounds and preparations)*.	Poison B	UN2759	Poison	173.345	173.346	1 quart	55 gallons	1,2	1,2	
	Arsenical pesticide, solid n.o.s.*(compounds and preparations)*.	Poison B	UN2759	Poison	173.364	173.367	50 pounds	200 pounds	1,2	1,2	
	Arsenic bromide, solid	Poison B	UN1555	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
E	Arsenic chloride, liquid. *See* Arsenic trichloride										
E	Arsenic disulfide. *See* Arsenic sulfide, solid										
	Arsenic iodide, solid	Poison B	NA1557	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
E	Arsenic pentoxide, solid *(RQ-5000/2270)*	Poison B	UN1559	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
	Arsenic, solid	Poison B	UN1558	Poison	173.364	173.366	50 pounds	200 pounds	1,2	1,2	
	Arsenic sulfide and a chlorate, mixtures of	Forbidden									
E	Arsenic sulfide, solid *(RQ-5000/2270)*	Poison B	NA1557	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	Keep dry
E	Arsenic trichloride, liquid *(RQ-5000/2270)*	Poison B	UN1560	Poison	173.345	173.346	1 quart	55 gallons	1,2	1,2	
E	Arsenic trioxide, solid *(RQ-5000/2270)*	Poison B	UN1561	Poison	173.364	173.365 173.366	50 pounds	200 pounds	1,2	1,2	
E	Arsenic trisulfide *(RQ-5000/2270)*	Poison B	NA1557	Poison	173.364	173.365	50 pounds	200 pounds	1,2	2	
E	Arsenic, white, solid. *See* Arsenic trioxide, solid										
E	Arsenous acid, solid. *See* Arsenic trioxide, solid										
	Arsenous and mercuric iodide solution	Poison B	NA2010	Poison	173.345	173.346	1 quart	55 gallons	1,2	1,2	
	Arsine	Poison A	UN2188	Poison gas and Flammable gas	None	173.328	Forbidden	Forbidden	1	5	Segregation same as for flammable gases
	Asbestos	ORM-C		None	173.1090	173.1090	No limit	No limit	1,2	1,2	Stow and handle to avoid airborne particles.
	Ascaridole (organic peroxide)	Forbidden									
W	Asphalt, *at or above its flashpoint*	ORM-C	NA1999	None	None	None	Forbidden	Forbidden	1	5	When applicable, no fire or residue thereof may be present in the furnace heating the substance while the vehicle is on board a cargo vehicle
	Asphalt, cut back	Flammable liquid	NA1999	Flammable liquid	173.118	173.131	1 quart	10 gallons	1,2	1	
	Asphalt, cut back	Combustible liquid	NA1999	None	173.118a	None	No limit	No limit	1,2	1,2	
	Automobile, motorcycle, tractor, or other self-propelled vehicle. See Motor vehicle										
	Automobile, motorcycle, tractor, or other self-propelled vehicle, engine, or other mechanical apparatus, with charged electric storage battery, wet. See Motor vehicle										
	Azaurolic acid (salt of), (dry)	Forbidden									
	3-Azido-1,2-Propylene glycol dinitrate	Forbidden									
	5-Azido-1-hydroxy tetrazole	Forbidden									

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Hazardous Materials Table—Continued

(1) + E A W	(2) Hazardous materials descriptions and proper shipping names	(3) Hazard class	(3A) Identification number	(4) Label(s) required (if not excepted)	(5) Packaging (a) Exceptions	(5) Packaging (b) Specific requirements	(6) Maximum net quantity in one package (a) Passenger carrying aircraft or railcar	(6) Maximum net quantity in one package (b) Cargo aircraft only	(7) Water shipments (a) Cargo vessel	(7) Water shipments (b) Passenger vessel	(7) Water shipments (c) Other requirements
	Azidodithiocarbonic acid	Forbidden									
	Azidoethyl nitrate	Forbidden									
	Azido guanidine picrate (dry)	Forbidden									
	Azido hydroxy tetrazole (mercury and silver salts)	Forbidden									
E	Azinphos methyl (*RQ-1/0.454*)	Poison B	NA2783	Poison	173.364	173.365	50 pounds	200 pounds	1,2	4	
E	Azinphos methyl mixture, liquid (*RQ-1/0.454*)	Poison B	NA2783	Poison	173.345	173.346	1 pint	1 quart	1,2	5	
	1-Aziridinyl phosphine oxide (tris). *See* Tris-(1-aziridinyl) phosphine oxide										
	Azotetrazole (dry)	Forbidden									
	Bags, burlap, used, must be classed for the hazardous material previously contained in bag. See 173.28, 173.29										
	Barium azide, wet, *50% or more water*	Flammable solid	UN1571	Flammable solid	None	173.230	Forbidden	1 pound	1,2	1,2	Stow away from heavy metals
	Barium chlorate	Oxidizer	UN1445	Oxidizer	173.153	173.163	25 pounds	100 pounds	1,2	1,2	Separate from ammonium compounds. Stow away from powdered metals
	Barium chlorate, wet	Oxidizer	NA1445	Oxidizer	173.153	173.163	25 pounds	200 pounds	1,2	1,2	Separate from ammonium compounds. Stow away from powdered metals
E	Barium cyanide, solid (*RQ-10/4.54*)	Poison B	UN1565	Poison	173.370	173.370	25 pounds	200 pounds	1,2	1,2	Stow away from acids
	Barium nitrate	Oxidizer	UN1446	Oxidizer	173.153	173.182	25 pounds	100 pounds	1,2	1,2	
A	Barium oxide	ORM-B	UN1884	None	173.505	173.800	25 pounds	100 pounds			
	Barium perchlorate	Oxidizer	UN1447	Oxidizer	173.153	173.154	25 pounds	100 pounds	1,2	1,2	Stow away from powdered metals
	Barium permanganate	Oxidizer	UN1448	Oxidizer	173.153	173.154	25 pounds	100 pounds	1,2	1,2	Separate from ammonium compounds and hydrogen peroxide
	Barium peroxide	Oxidizer	UN1449	Oxidizer	173.153	173.156	25 pounds	100 pounds	1,2	1,2	Keep dry
	Barium styphnate, monohydrate. See Initiating explosive										
	Barrel, empty. See Drum, empty										
	Battery, dry. Not subject to Parts 170-189 of this subchapter										
	Battery, *electric storage*, dry (containing potassium hydroxide, dry solid, *flake, bead, or granular*)	Corrosive material	NA1813	Corrosive	173.244	173.245b	25 pounds	100 pounds	1,2	1,2	Keep dry
	Battery, *electric storage*, wet, filled with acid	Corrosive material	UN2794	Corrosive	173.260	173.260	Forbidden	No limit	1,2	1,2	
	Battery, *electric storage*, wet, *filled with acid*, with automobile (*or specifically named self-propelled vehicle or mechanical apparatus*)	Corrosive material	NA2794	Corrosive	173.250	173.260	No limit	No limit	1,2	1,2	Keep dry

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	Battery, *electric storage, wet, filled with alkali, with automobile (or specifically named self-propelled vehicle or mechanical apparatus)*	Corrosive material	NA2795	Corrosive	173.250	173.260	No limit	No limit	1,2	1,2	Keep dry
	Battery, *electric storage,* wet, with wheelchair	Corrosive material		Corrosive	173.250	173.250 175.10	No limit	No limit	1,2	1,2	Keep dry
	Battery, electric storage, wet, nonspillable. See § 173.260(d)										
	Battery, *electric storage,* wet, filled with alkali	Corrosive material	UN2795	Corrosive	173.260	173.260	Forbidden	No limit	1,2	1,2	
	Battery fluid, acid	Corrosive material	UN2796	Corrosive	173.244	173.257	1 quart	5 gallons	1,2	1,2	
	Battery fluid, acid, with electronic equipment *or* actuating device	Corrosive material	NA2796	Corrosive	None	173.259	Forbidden	5 pints	1,2	1,2	
	Battery fluid, acid, with battery, *electric storage, wet, empty, or dry*	Corrosive material	NA2796	Corrosive	None	173.258	Forbidden	5 pints	1,2	1,2	
	Battery fluid, alkali	Corrosive material	UN2797	Corrosive	173.244	173.257	1 quart	5 gallons	1,2	1,2	
	Battery fluid, alkali, with electronic equipment *or* actuating device	Corrosive material	NA2797	Corrosive	None	173.259	Forbidden	5 pints	1,2	1,2	
	Battery fluid, alkali, with battery, *electric storage wet, empty or dry*	Corrosive material	UN2797	Corrosive	None	173.258	Forbidden	5 pints	1,2	1,2	
	Battery, lithium. See 173.206(f)										
W	Battery parts *(plates, grids, etc. unwashed, exhausted)*	ORM-C		None	173.505	173.915			1,2	4	
	Benzaldehyde	Combustible liquid	NA1990	None	173.118a	None	No limit	No limit	1,2	1,2	
E	Benzene *(benzol) (RQ-1000/454)*	Flammable liquid	UN1114	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Benzene diazonium chloride (dry)	Forbidden									
	Benzene diazonium nitrate (dry)	Forbidden									
	Benzene phosphorus dichloride	Corrosive material	UN2798	Corrosive	None	173.250a	Forbidden	5 pints	1	5	
	Benzene phosphorus thiodichloride	Corrosive material	UN2799	Corrosive	None	173.250a	Forbidden	5 pints	1	5	
	Benzenethiol. See Phenyl mercaptan										
	Benzene triozonide	Forbidden									
	Benzidine	Poison B	UN1885	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1	
	Benzine	Flammable liquid	UN1115	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
E	Benzoic acid *(RQ-5000/2270)*	ORM-E	NA9094	None	None	173.510	No limit	No limit	1,2	1,2	
	Benzoic derivative pesticide, liquid, n.o.s. *(compounds and preparations).*	Flammable liquid	UN2770	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Benzoic derivative pesticide, liquid, n.o.s. *(compounds and preparations),*	Poison B	UN2769	Poison	173.345	173.346	1 quart	55 gallons	1,2	1,2	
	Benzoic derivative pesticide, solid, n.o.s. *(compounds and preparations),* solid	Poison B	UN2769	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
E	Benzonitrile *(RQ-1000/454)*	Combustible liquid	UN2224	None	173.118a	None	No limit	No limit	1,2	1,2	
	Benzoxdiazoles (dry)	Forbidden									
	Benzoyl azide	Forbidden									
E	Benzoyl chloride*(RQ-1000/454)*	Corrosive material	UN1736	Corrosive	173.244	173.247	1 quart	1 quart	1	1	Keep dry. Glass carboys not permitted on passenger vessels
	Benzoyl peroxide	Organic peroxide	NA2085	Organic peroxide	None	173.157 173.156	Forbidden	25 pounds	1,2	1	

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Hazardous Materials Table—Continued

(1)	(2)	(3)	(3A)	(4)	(5) Packaging		(6) Maximum net quantity in one package		(7) Water shipments		
+/E/A/W	Hazardous materials descriptions and proper shipping names	Hazard class	Identification number	Label(s) required (if not excepted)	(a) Exceptions	(b) Specific requirements	(a) Passenger carrying aircraft or railcar	(b) Cargo aircraft only	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Benzoyl peroxide, *more than 77% but less than 95% with water. See* Benzoyl peroxide		UN2088								
	Benzoyl peroxide, *not less than 30% but not more than 52% with inert solid. See* Organic peroxide, solid, n.o.s.		UN2089								
	Benzoyl peroxide, *not more than 72% as a paste. See* Organic peroxide, solid, n.o.s.		UN2087								
	Benzoyl peroxide, *not more than 77% with water. See* Benzoyl peroxide		UN2090								
	Benzoyl peroxide, *technically pure or* Benzoyl peroxide, *more than 52% with inert solid. See* Benzoyl peroxide		UN2085								
	Benzyl bromide (*bromotoluene, alpha*)	Corrosive material	UN1737	Corrosive	None	173.291	Forbidden	5 pints	1	5	Keep dry
E	Benzyl chloride (*RQ-100/45.4*)	Corrosive material	UN1738	Corrosive	173.244	173.295	Forbidden	1 quart	1	4	Keep dry
	Benzyl chloroformate (*benzyl chlorocarbonate*)	Corrosive material	UN1739	Corrosive	None	173.288	Forbidden	5 pints	1	5	Keep dry
E	Beryllium chloride (*RQ-5000/2270*)	Poison B	NA1566	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
	Beryllium compound, n.o.s.	Poison B	UN1566	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
E	Beryllium fluoride (*RQ-5000/2270*)	Poison B	NA1566	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
E	Beryllium nitrate (*RQ-5000/2270*)	Oxidizer	UN2464	Oxidizer	173.153	173.182	25 pounds	100 pounds	1,2	1,2	
	Biphenyl triozonide	Forbidden									
	Bipyridilium pesticide, liquid, n.o.s. (*compounds and preparations*),	Flammable liquid	UN2782	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Bipyridilium pesticide, liquid, n.o.s. (*compounds and preparations*),	Poison B	UN2781	Poison	173.345	173.346	1 quart	55 gallons	1,2	1,2	
	Bipyridilium pesticide, solid, n.o.s. (*compounds and preparations*),	Poison B	UN2781	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
	Black powder	Class A explosive		Explosive A	None	173.60	Forbidden	Forbidden	6	5	
	Black powder igniter with empty cartridge bag	Class C explosive		Explosive C	None	173.106	50 pounds	150 pounds	1,3	1,3	
	Blasting agent, n.o.s.	Blasting agent		Blasting agent	None	173.114a	Forbidden	100 pounds	1,2	1,2	
	Blasting caps. See Detonators, Class A *or* Class C explosives										
	Blasting caps, electric. See Detonators, Class A *or* Class C explosives										
	Blasting caps, percussion activated. See Detonators, Class A *or* Class C explosives										

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	Blasting caps with detonating cord. See Detonators, Class A or Class C explosives and Detonating primers, Class A or Class C explosives										
	Blasting caps with metal clad mild detonating fuze. See Detonators, Class A *or* Class C explosives										
	Blasting caps with safety fuse. See Detonators, Class A *or* Class C explosives										
	Blasting caps with shock tubes. See Detonators, Class A *or* Class C explosives										
	Blasting gelatin. See High explosive										
	Blasting powder. See Black powder										
W	Bleaching powder, *containing 39% or less available chlorine*	ORM-C	UN2208	None	173.505	173.920			1,2	1,2	Keep dry. Stow separate from flammable liquids and acids. (Stow away from oils, grease, and similar organic materials.
	Bomb, explosive. See Explosive bomb										
	Bomb, explosive with gas, smoke, or incendiary material. See Explosive bomb										
	Bomb, fireworks. See Fireworks, special										
	Bomb, gas, smoke, or incendiary, nonexplosive. See Chemical ammunition, nonexplosive										
	Bomb, incendiary, or smoke without bursting charge. See Fireworks, special										
	Bomb, practice, with electric primer or electric squib (non-explosive). See 173.55										
	Bomb, sand-loaded or empty (non-explosive). See 173.55										
	Booster, explosive	Class A explosive		Explosive A	None	173.69	Forbidden	Forbidden	6	5	
	Bordeaux arsenite, liquid	Poison B	NA2759	Poison	173.345	173.346	1 quart	55 gallons	1,2	1,2	
	Bordeaux arsenite, solid	Poison B	NA2759	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
	Boron tribromide	Corrosive material	UN2692	Corrosive	None	173.251	Forbidden	1 quart	1	5	
	Boron trichloride	Corrosive material	UN1741	Corrosive	None	173.251	Fobidden	1 quart	1,2	5	Stow in well ventilated space. Shade from radiant heat. Segregation same as for nonflammable gases.
+	Boron trifluoride	Nonflammable gas	UN1008	Nonflammable gas and Poison	None	173.302	Forbidden	Forbidden	1	5	Stow away from living quarters and foodstuffs
	Boron trifluoride acetic acid complex	Corrosive material	UN1742	Corrosive	173.244	173.247	1 quart	1 gallon	1,2	1,2	
	Bromine	Corrosive material	UN1744	Corrosive	None	173.252	Forbidden	1 quart	1	5	Keep cool
	Bromine azide	Forbidden									
	Bromine pentafluoride	Oxidizer	UN1745	Oxidizer	None	173.246	Forbidden	100 pounds	1	5	Shade from radiant heat. Segregation same as for corrosives
	Bromine trifluoride	Oxidizer	UN1746	Oxidizer and Poison	None	173.246	Forbidden	100 pounds	1	5	Shade from radiant heat. Segregation same as for corrosives
	4-Bromo-1,2-dinitrobenzene (unstable at 59 deg C.)	Forbidden									
	1-Bromo-3-nitrobenzene (unstable at 56°C)	Forbidden									
	Bromoacetic acid, solid	Corrosive material	UN1938	Corrosive	173.244	173.245b	25 pounds	100 pounds	1,2	1,2	Keep dry
	Bromoacetic acid solution	Corrosive material	UN1938	Corrosive	173.244	173.245	1 quart	1 quart	1,2	1,2	Glass carboys in hampers not permited under deck

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Hazardous Materials Table—Continued

(1) +/E/A/W	(2) Hazardous materials descriptions and proper shipping names	(3) Hazard class	(3A) Identification number	(4) Label(s) required (if not excepted)	(5) Packaging (a) Exceptions	(5) Packaging (b) Specific requirements	(6) Maximum net quantity in one package (a) Passenger carrying aircraft or railcar	(6) Maximum net quantity in one package (b) Cargo aircraft only	(7) Water shipments (a) Cargo vessel	(7) Water shipments (b) Passenger vessel	(7) Water shipments (c) Other requirements
	Bromoacetone, liquid	Poison A	UN1569	Poison gas	None	173.329	Forbidden	Forbidden	1	5	
	Bromobenzene	Combustible liquid	UN2514	None	173.118a	None	No limit	No limit	1,2	1,2	Segregation same as for flammable liquids
A	Bromochloromethane	ORM-A	UN1887	None	173.505	173.605	10 gallons	55 gallons			
	Bromosilane	Forbidden									
	Bromotoluene, alpha. See Benzyl bromide										
	Bromotrifluoromethane *(R-13B1 or H-1301)*	Nonflammable gas	UN1009	Nonflammable gas	173.306	173.304 173.314 173.315	150 pounds	300 pounds	1,2	1,2	
	Brucine, solid *(dimethoxy strychnine)*	Poison B	UN1570	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
	Burnt cotton, not repicked	Flammable solid	NA1325	Flammable solid	None	173.159	Forbidden	Forbidden	1	5	Separate from flammable gases or liquids, oxidizing materials, or organic peroxides
	Burster, explosive	Class A explosive		Explosive A	None	173.69	Forbidden	Forbidden	6	5	
+	Butadiene, inhibited	Flammable gas	UN1010	Flammable gas	173.306	173.304 173.314 173.315	Forbidden	300 pounds	1,2	1	Stow away from living quarters
	Butane *or* Liquefied petroleum gas. *See* Liquefied petroleum gas										
	1,2,4-Butanetriol trinitrate	Forbidden									
	tert-Butoxycarbonyl azide	Forbidden									
	n-Butyl-4,4-di-(tert-butylperoxy)valerate, *technically pure. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2140								
	n-Butyl-4,4-di-(tert-butylperoxy)valerate, *not more than 52% with inert solid. See* Organic peroxide, solid, n.o.s.		UN2141								
E	Butyl acetate *(RQ-5000/2270)*	Flammable liquid	UN1123	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	n-Butyl acid phosphate. *See* Acid butyl phosphate										
	Butyl alcohol	Flammable liquid	NA1120	Flammable liquid	173.118	173.125	1 quart	10 gallons	1,2	1	
E	Butylamine *(RQ-1000/454)*	Flammable liquid	UN1125	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Butyl bromide, *normal*	Flammable liquid	UN1126	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Butyl chloride	Flammable liquid	UN1127	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	

tert-Butyl cumyl peroxide, *technically pure or* tert-Butyl cumene peroxide, *technically pure. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2091								
Butyl ether	Flammable liquid	UN1149	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1,2	
Butyl formate	Flammable liquid	UN1128	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
tert-Butyl hydroperoxide, *more than 72% but not more than 90% with water. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2094								
tert-Butyl hydroperoxide, *not more than 72% with water. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2093								
tert-Butyl hydroperoxide, *not more than 80% in di-tert-butyl peroxide and solvent. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2092								
tert-Butyl hydroperoxide, *not more than 80% in di-tert-butyl peroxide or solvent. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2092								
tert-Butyl hydroperoxide, more than 90% with water	Forbidden									
n-Butyl isocyanate	Flammable liquid	UN2485	Flammable liquid and Poison	None	173.119 173.3a	1 quart	10 gallons	1,2	1	
tert-Butyl isopropyl benzene hydroperoxide	Organic peroxide	NA2091	Organic peroxide	173.153	173.224	1 quart	1 quart	1,2	4	
Butyl mercaptan	Flammable liquid	UN2347	Flammable liquid	None	173.141	Forbidden	10 gallons	1,3	5	
tert-Butyl peroxy-2-ethylhexanoate, *technically pure. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2143								
tert-Butyl peroxy-2-ethylhexanoate, *not more than 30%* with 2,2-Di-(tert-butylperoxy)butane, *not more than 35%, with not less than 35% phlegmatizer. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2886								
tert-Butyl peroxy-2-ethylhexanoate, *not more than 12%* with 2,2-Di-(tert-butylperoxy)butane, *not more than 14% with not less than 14% phlegmatizer and 60% inert inorganic solid. See* Organic peroxide, solid, n.o.s.		UN2887								
tert-Butyl peroxy-2-ethylhexanoate, *not more than 50% with phlegmatizer. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2888								
tert-Butyl peroxy-3,5,5-trimethylhexanoate *or* tert-Butyl peroxyisononanoate, *technically pure. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2104								

Hazardous Materials Table—Continued

(1) +/E/A/W	(2) Hazardous materials descriptions and proper shipping names	(3) Hazard class	(3A) Identification number	(4) Label(s) required (if not excepted)	(5) Packaging (a) Exceptions	(5) Packaging (b) Specific requirements	(6) Maximum net quantity in one package (a) Passenger carrying aircraft or railcar	(6) Maximum net quantity in one package (b) Cargo aircraft only	(7) Water shipments (a) Cargo vessel	(7) Water shipments (b) Passenger vessel	(7) Water shipments (c) Other requirements
	3-tert-Butyl peroxy-3-phenylphthalide, *technically pure. See* Organic peroxide, solid, n.o.s.		UN2596								
	tert-Butyl peroxyacetate, *not more than 76% in solution. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2095								
	tert-Butyl peroxyacetate, *not more than 52% in solution. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2096								
	tert-Butyl peroxyacetate, more than 76% in solution	Forbidden									
	tert-Butyl peroxybenzoate, *not more than 75% in solution. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2098								
	tert-Butyl peroxybenzoate, *not more than 50% with inert inorganic solid. See* Organic peroxide, solid, n.o.s.		UN2890								
	tert-Butyl peroxybenzoate, *technically pure or* tert-Butyl peroxybenzoate, *more than 75% in solution. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2097								
	tert-Butyl peroxycrotonate, *not more than 76% in solution. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2183								
	n-Butyl peroxydicarbonate, *not more than 52% in solution. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2169								
	n-Butyl peroxydicarbonate, *not more than 27% in solution. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2170								
	n-Butyl peroxydicarbonate, more than 52% in solution	Forbidden									
	tert-Butyl peroxydiethylacetate, 33% with tert-Butyl peroxybenzoate, 33%, *and solvent. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2551								
	tert-Butyl peroxydiethylacetate, *technically pure. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2144								

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	tert-Butyl peroxyisobutyrate, *more than 52% but not more than 77% in solution*. See Organic peroxide, liquid *or* solution, n.o.s.		UN2142								
	tert-Butyl peroxyisobutyrate, *not more than 52% in solution*. See Organic peroxide, liquid *or* solution, n.o.s.		UN2562								
	tert-Butyl peroxyisobutyrate, more than 77% in solution	Forbidden									
	tert-Butyl peroxyisopropyl carbonate, *technically pure*. See Organic peroxide, liquid *or* solution, n.o.s.		UN2103								
	tert-Butyl peroxymaleate, *not more than 55% in solution*. See Organic peroxide, liquid *or* solution, n.o.s.		UN2100								
	tert-Butyl peroxymaleate, *not more than 55% as a paste*. See Organic peroxide, solid, n.o.s.		UN2101								
	tert-Butyl peroxymaleate, *technically pure*. See Organic peroxide, solid, n.o.s.		UN2099								
	tert-Butyl peroxyneodecanoate, *not more than 77% in solution*. See Organic peroxide, liquid *or* solution, n.o.s.		UN2177								
	tert-Butyl peroxyneodecanoate, *technically pure*. See Organic peroxide, liquid *or* solution, n.o.s.		UN2594								
	tert-Butyl peroxyphthalate, *technically pure*. See Organic peroxide, solid, n.o.s.		UN2105								
	tert-Butyl peroxypivalate, *not more than 77% in solution*. See Organic peroxide, liquid *or* solution, n.o.s.		UN2110								
	Butyl phosphoric acid. *See* Acid butyl phosphate										
E	n-Butyl phthalate (*RQ-100/45.4*)	ORM-E	NA9095	None	None	173.510	No limit	No limit	1,2	1,2	
	Butyl trichlorosilane	Corrosive material	UN1747	Corrosive	None	173.280	Forbidden	10 gallons	1	1	Keep dry
	Butyraldehyde	Flammable liquid	UN1129	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
E	Butyric acid (*RQ-5000/2270*)	Corrosive material	UN2820	Corrosive	173.244	173.245	1 quart	10 gallons	1,2	1,2	
	Cabazide	Forbidden									
E	Cadmium acetate (*RQ-100/45.4*)	ORM-E	NA2570	None	None	173.510	No limit	No limit	1,2	1,2	
E	Cadmium bromide (*RQ-100/45.4*)	ORM-E	NA2570	None	None	173.510	No limit	No limit	1,2	1,2	
E	Cadmium chloride (*RQ-100/45.4*)	ORM-E	NA2570	None	None	173.510	No limit	No limit	1,2	1,2	If stowed under deck, must be stowed in a recoverable location
E	Calcium arsenate, solid (*RQ-1000/454*)	Poison B	UN1573	Poison	173.364	173.367 173.368	50 pounds	200 pounds	1,2	1,2	
E	Calcium arsenite, solid (*RQ-1000/454*)	Poison B	NA1574	Poison	173.364	173.367	50 pounds	200 pounds	1,2	1,2	
	Calcium bisulfite solution. *See* Calcium hydrogen sulfite solution										
E	Calcium carbide (*RQ-5000/2270*)	Flammable solid	UN1402	Flammable solid and Dangerous when wet	None	173.178	Forbidden	25 pounds	1,2	1,2	Keep dry. Stow away from copper, its alloys, and salts
	Calcium chlorate	Oxidizer	UN1452	Oxidizer	173.153	173.163	25 pounds	100 pounds	1,2	1,2	Separate from ammonium compounds. Stow away from powdered metals and cyanide

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Hazardous Materials Table—Continued

(1) +/E/A/W	(2) Hazardous materials descriptions and proper shipping names	(3) Hazard class	(3A) Identification number	(4) Label(s) required (if not excepted)	(5) Packaging (a) Exceptions	(5) Packaging (b) Specific requirements	(6) Maximum net quantity in one package (a) Passenger carrying aircraft or railcar	(6) Maximum net quantity in one package (b) Cargo aircraft only	(7) Water shipments (a) Cargo vessel	(7) Water shipments (b) Passenger vessel	(7) Water shipments (c) Other requirements
	Calcium chlorite	Oxidizer	UN1453	Oxidizer	None	173.160	Forbidden	100 pounds	1,2	1,2	Separate from ammonium compounds, powdered materials, and cyanides
E	Calcium chromate (*RQ-1000/454*)	ORM-E	NA9096	None	None	173.510	No limit	No limit	1,2	1,2	
AW	Calcium cyanamide, not hydrated (*containing more than 0.1% calcium carbide*)	ORM-C	UN1403	None	None	173.945	25 pounds	200 pounds	1,2	1,2	Segregation same as for flammable solids labeled Dangerous When Wet
E	Calcium cyanide, solid *or* Calcium cyanide mixture, solid (*RQ-10/4.54*)	Poison B	UN1575	Poison	173.370	173.370	25 pounds	200 pounds	1,2	1,2	Stow away from corrosive liquids. Keep dry
E	Calcium dodecylbenzenesulfonate (*RQ-1000/454*)	ORM-E	NA9097	None	None	173.510	No limit	No limit	1,2	1,2	
	Calcium hydrogen sulfite solution	Corrosive material	NA2693	Corrosive	173.244	173.245	1 quart	5 gallons	1,2	1,2	
E	Calcium hypochlorite, hydrated (*minimum 5.5% but not more than 10% water, and containing more than 39% available chlorine*) (*RQ-100/45.4*)	Oxidizer	UN2880	Oxidizer	173.153	173.217	50 pounds	100 pounds	1,2	1,2	
E	Calcium hypochlorite mixture, *dry. (Containing more than 39% available chlorine)* (*RQ-100/45.4*)	Oxidizer	UN1748	Oxidizer	173.153	173.217	50 pounds	100 pounds	1,2	1,2	Keep cool and dry
	Calcium, metal	Flammable solid	UN1401	Flammable solid and Dangerous when wet	173.153	173.154	25 pounds	100 pounds	1,2	4	Keep cool and dry. Segregation same as for flammable solids labeled Dangerous When Wet
	Calcium, metal, crystalline	Flammable solid	NA1401	Flammable solid and Dangerous when wet	None	173.231	Forbidden	25 pounds	1,2	5	Keep cool and dry. Segregation same as for flammable solids labeled Dangerous When Wet
	Calcium nitrate (*See 173.182(a) Note*)	Oxidizer	UN1454	Oxidizer	173.153	173.182	25 pounds	100 pounds	1,2	1,2	
AW	Calcium oxide	ORM-B	UN1910	None	173.505	173.800	25 pounds	100 pounds	1,2	1,2	Keep dry. Stow away from explosives, acids, combustible materials, and ammonium salts
	Calcium permanganate	Oxidizer	UN1456	Oxidizer	173.153	173.154	25 pounds	100 pounds	1,2	1,2	Separate from ammonium compounds and hydrogen peroxide
	Calcium peroxide	Oxidizer	UN1457	Oxidizer	173.153	173.156	25 pounds	100 pounds	1,2	1,2	Keep dry
	Calcium phosphide	Flammable solid	UN1360	Flammable solid and Dangerous when wet	None	173.161	Forbidden	25 pounds	1	5	Keep cool and dry. Segregation same as for flammable solids labeled Dangerous When Wet
	Calcium resinate	Flammable solid	UN1313	Flammable solid	None	173.169	Forbidden	125 pounds	1	5	
	Calcium resinate, fused	Flammable solid	UN1314	Flammable solid	None	173.169	Forbidden	125 pounds	1	5	

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	Calcium silicon (*powder*)	Flammable solid	UN1405	Flammable solid and Dangerous when wet	173.153	173.178	Forbidden	25 pounds	1,2	4	Segregation same as for flammable solids labeled Dangerous When Wet
AW	Camphene	ORM-A	NA9011	None	173.505	173.610	No limit	No limit	1,3	1,3	Stow away from foodstuffs and living quarters
	Camphor oil	Combustible liquid	UN1130	None	173.118a	None	No limit	No limit	1,2	1,2	
	Cannon primer	Class C explosive		None	None	173.107	50 pounds	150 pounds	1,3	5	
	Caprylyl peroxide solution	Organic peroxide	NA2129	Organic peroxide	173.153	173.221	1 quart	1 quart	1,2	4	Keep cool. Stow separate from combustible materials, explosives, or acids
	Caps, blasting. See Detonators, Class A *or* Class C explosives										
	Caps, toy. See Toy caps										
E	Captan (*RQ-10/4.54*)	ORM-E	NA9099	None	None	173.510	100 pounds	No limit	1,2	1,2	
	Carbamate pesticide, liquid, n.o.s. (*compounds and preparations*),	Flammable liquid	UN2758	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Carbamate pesticide, liquid, n.o.s. (*compounds and preparations*),	Poison B	UN2757	Poison	173.345	173.346	1 quart	55 gallons	1,2	1,2	
	Carbamate pesticide, solid, n.o.s. (*compounds and preparations*),	Poison B	UN2757	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
EA	Carbaryl (*RQ-100/45.4*)	ORM-A	NA2757	None	173.505	173.510	No limit	No limit	1,2	1,2	
E	Carbofuran (*RQ-10/4.54*)	Poison B	NA2757	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
E	Carbofuran mixture, liquid (RQ-10/4.54)	Poison B	NA2757	Poison	173.345	173.346	1 quart	55 gallons	1,2	1,2	
+E	Carbolic acid. *See* Phenol										
E	Carbolic acid, liquid (*liquid tar acid containing over 50% phenol*). *See* Phenol, liquid										
	Carbon bisulfide, *or* Carbon disulfide (*RQ-5000/2270*)	Flammable liquid	UN1131	Flammable liquid	None	173.121	Forbidden	Forbidden	1	5	Keep cool. Not permitted on any vessel transporting explosives, except that quantities not exceeding 200 pounds may be transported on such vessels under conditions approved by the Captain of the Port
	Carbon dioxide	Nonflammable gas	UN1013	Nonflammable gas	173.306	173.302 173.304	150 pounds	300 pounds	1,2	1,2	
	Carbon dioxide-nitrous oxide mixture	Nonflammable gas	UN1015	Nonflammable gas	173.306	173.304	150 pounds	300 pounds	1,2	1,2	
	Carbon dioxide-oxygen mixture	Nonflammable gas	UN1014	Nonflammable gas	173.306	173.304	150 pounds	300 pounds	1,2	1,2	
	Carbon dioxide, refrigerated liquid	Nonflammable gas	UN2187	Nonflammable gas	173.306	173.314 173.315	150 pounds	300 pounds	1,2	1,2	
AW	Carbon dioxide, solid, *or* Dry ice, *or* Carbonice	ORM-A	UN1845	None	None	173.615	440 pounds	440 pounds	1	1	Stow away from open ventilators. Stow away from cyanides or cyanide mixtures, liquid or dry
+	Carbon monoxide	Flammable gas	UN1016	Flammable gas	173.306	173.302	Forbidden	150 pounds	1	4	
	Carbon monoxide, cryogenic liquid	Flammable gas	NA9202	Flammable gas	None	173.318	Forbidden	Forbidden	1	5	Stow away from living quarters
EAW	Carbon tetrachloride (*RQ-5000/2270*)	ORM-A	UN1846	None	173.505	173.620	1 quart	55 gallons	1,2	1,2	Stow away from living quarters
	Carbonyl chloride. See Phosgene										
	Carboys, empty, must be classed for the hazardous material previously contained in carboy. See 173.29										
	Cartridge bags, empty, with black powder igniter	Class C explosive		Explosive C	None	173.106	50 pounds	150 pounds	1,3	1,3	
	Cartridge, practice ammunition	Class C explosive		Explosive C	None	173.101a	50 pounds	150 pounds	1,2	1,2	

Hazardous Materials Table—Continued

(1)	(2)	(3)	(3A)	(4)	(5)		(6)		(7)		
					Packaging		Maximum net quantity in one package		Water shipments		
+ E A W	Hazardous materials descriptions and proper shipping names	Hazard class	Identification number	Label(s) required (if not excepted)	(a) Exceptions	(b) Specific requirements	(a) Passenger carrying aircraft or railcar	(b) Cargo aircraft only	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Case oil. See Gasoline *or* Naptha										
	Casinghead gasoline. See Gasoline										
W	Castor Beans	ORM-C		None	173.505	173.952			1,2	1,2	Stow away from living quarters and foodstuffs. Bulk shipments permitted in tight vans or containers only on cargo vessels (Castor beans only)
W	Castor pomace. *See* Castor beans										
E	Caustic, potash, dry, solid, flake, bead, *or* granular. *See* Potassium hydroxide, dry, *etc*										
E	Caustic potash, liquid *or* solution. *See* Potassium hydroxide solution										
E	Caustic soda, dry, solid, flake, bead, *or* granular. *See* Sodium hydroxide, dry, *etc.*										
E	Caustic soda, liquid *or* solution. *See* Sodium hydroxide solution										
W	*Cellosolve. See* Ethylene glycol monoethyl ether										
W	*Cellosolve acetate. See* Ethylene glycol monoethyl ether acetate										
	Cement	Combustible Liquid	NA1133	None	173.118a	None	No limit	No limit	1,2	1,2	
	Cement	Flammable liquid	NA1133	Flammable liquid	173.118	173.132	1 quart	10 gallons	1,2	1	
	Cement, adhesive, n.o.s. *See* Cement										
	Cement, container, linoleum, tile, *or* wallboard, liquid	Flammable liquid	NA1133	Flammable liquid	173.118	173.132	1 quart	15 gallons	1,2	1	
	Cement, leather	Flammable liquid	NA1133	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Cement, pyroxylin	Flammable liquid	NA1133	Flammable liquid	173.118	173.132	1 quart	15 gallons	1,2	1	
	Cement, roofing, liquid	Flammable liquid	NA1133	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Cement, rubber	Flammable liquid	NA1133	Flammable liquid	173.118	173.132	1 quart	15 gallons	1,2	1	
	Cesium metal	Flammable solid	UN1407	Flammable solid and Dangerous when wet	None	173.206	Forbidden	25 pounds	1,2	5	Segregation same as for flammable solids labeled Dangerous When Wet
	Charcoal briquettes *or* briquets	Flammable solid	NA1361	Flammable solid	173.162	173.162	50 pounds	50 pounds	1,2	1,2	

	Charcoal screenings, made from 'pinon' wood	Flammable solid	NA1361	Flammable solid	173.162	173.162	25 pounds	200 pounds	1,2	1,	
	Charcoal, shell	Flammable solid	NA1361	Flammable solid	173.162	173.162	25 pounds	200 pounds	1,2	1,2	
	Charcoal, wood, ground, crushed, granulated, *or* pulverized	Flammable solid	NA1361	Flammable solid	173.162	173.162	25 pounds	200 pounds	1,2	1,2	
	Charcoal, wood, lump	Flammable solid	NA1361	Flammable solid	173.162	173.162	50 pounds	50 pounds	1,2	1,2	
	Charcoal wood screenings, other than 'pinon' wood screenings	Flammable solid	NA1361	Flammable solid	None	173.162	Forbidden	Forbidden	1	1	
	Charged well casing jet perforating gun *(total explosive contents in guns 20 pounds or more per motor vehicle)*	Class A explosive		Explosive A	None	173.53 173.60	Forbidden	Forbidden			Forbidden
	Charged well casing jet perforating gun *(total explosive contents in guns not exceeding 20 pounds per motor vehicle or special offshore down hole tool pallet*	Class C explosive		Explosive C	None	173.53 173.110	Forbidden	Forbidden	1,2	5	
	Chemical ammunition, explosive. See Ammunition, chemical, explosive, with ...										
	Chemical ammunition, nonexplosive *(containing a Poison B material)*	Poison B	UN2016	Poison	173.345	173.350	Forbidden	55 gallons			See correct shipping name of applicable Poison B material for stowage, special handling, and special segregation requirements
	Chemical ammunition, nonexplosive *(containing an irritating material)*	Irritating material	UN2017	Irritant	None	173.398	Forbidden	20 pounds			See correct shipping name of applicable Irritant material for stowage, special handling, and special segregation requirements
	Chemical ammunition, nonexplosive *(containing a Poison A material)*	Poison A	UN2016	Poison gas	None	173.330	Forbidden	Forbidden			See correct shipping name of applicable Poison A material for stowage, special handling, and special segregation requirements
	Chemical kit	Corrosive material	NA1760	Corrosive	173.286		1 quart	1 quart	1,3	1,3	
	Chlorate and borate mixture *(containing more than 28% chlorate)*	Oxidizer	UN1458	Oxidizer	173.153	173.229	25 pounds	100 pounds	1,2	4	Stow away from ammonium compounds and away from powdered metals
	Chlorate and magnesium chloride mixture *(containing more than 28% chlorate)*	Oxidizer	UN1459	Oxidizer	173.153	173.229	25 pounds	100 pounds	1,2	4	Stow away from ammonium compounds, and away from powdered metals
	Chlorate explosive, dry. See High explosive										
	Chlorate, n.o.s.	Oxidizer	UN1461	Oxidizer	173.153	173.163	25 pounds	100 pounds	1,2	4	Stow away from ammonium compounds and away from powdered metals
	Chlorate, n.o.s., wet	Oxidizer	NA1461	Oxidizer	173.153	173.163	25 pounds	200 pounds	1,2	4	Stow away from ammonium compounds and away from powdered metals
	Chlorate of potash. *See* Potassium chlorate										
	Chlorate of soda. *See* Sodium chlorate										
	Chlorate powder. *See* High explosive										
E	Chlordane, liquid *(RQ-1/0.454)*	Flammable liquid	NA2762	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
E	Chlordane, liquid *(RQ-1/0.454)*	Combustible liquid	NA2762	None	173.118a	None	No limit	No limit	1,2	1,2	
	Chloric acid	Oxidizer	NA2626	Oxidizer and Poison	None	173.237	Forbidden	Forbidden			Forbidden
	Chloride of phosphorus. *See* Phosphorus trichloride										
	Chloride of sulfur. *See* Sulfur chloride										
W	Chlorinated lime *(chloride of lime.) See* Bleaching powder										
+E	Chlorine *(RQ-10/4.54)*	Nonflammable gas	UN1017	Nonflammable gas and Poison	None	173.304 173.314 173.315	Forbidden	Forbidden	1,2	5	Stow in a well-ventilated space. Stow away from organic materials
	Chlorine azide	Forbidden									

Hazardous Materials Table--Continued

(1)	(2)	(3)	(3A)	(4)	(5)		(6)		(7)		
					Packaging		Maximum net quantity in one package		Water shipments		
+/ E/ A/ W	Hazardous materials descriptions and proper shipping names	Hazard class	Identification number	Label(s) required (if not excepted)	(a) Exceptions	(b) Specific requirements	(a) Passenger carrying aircraft or railcar	(b) Cargo aircraft only	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Chlorine dioxide hydrate, frozen	Oxidizer	NA9191	Oxidizer and Poison	None	173.237	Forbidden	Forbidden			Forbidden
	Chlorine dioxide (not hydrate)	Forbidden									
	Chlorine trifluoride	Oxidizer	UN1749	Oxidizer and Poison	None	173.246	Forbidden	100 pounds	1,3	5	Stow in well ventilated area away from organic material
	Chloroacetic acid, liquid *or* solution	Corrosive material	UN1750	Corrosive	173.244	173.294	1 quart	1 quart	1,2	1,2	Glass carboys in hampers not permitted under deck
	Chloroacetic acid, solid	Corrosive material	UN1751	Corrosive	173.244	173.245b	25 pounds	100 pounds	1,2	1,2	Keep dry
	Chloroacetophenone, gas, liquid, *or* solid (CN)	Irritating material	UN1697	Irritant	None	173.382	Forbidden	75 pounds	1	5	
	Chloroacetyl chloride	Corrosive material	UN1752	Corrosive	None	173.253	Forbidden	1 quart	1	5	Keep dry
E	Chlorobenzene(*RQ-100/45.4*)	Flammable liquid	UN1134	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1,2	
E	Chlorobenzol. *See* Chlorobenzene										
	p-Chlorobenzoyl peroxide	Organic peroxide	UN2113	Organic peroxide	None	173.157 173.158	Forbidden	25 pounds	1	1	
	p-Chlorobenzoyl peroxide, *not more than 75% with water. See* p-Chlorobenzoyl peroxide		UN2113								
	p-Chlorobenzoyl peroxide, *not more than 52% as a paste. See* Organic peroxide, solid, n.o.s.		UN2114								
	p-Chlorobenzoyl peroxide, *not more than 52% in solution. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2115								
	Chlorodinitrobenzene. See Dinitrochlorobenzene										
	1-Chloro-1,1-difluoroethane. *See* Chlorodifluoroethane (*R-142b*)										
+	Chlorodifluoroethane (*R-142b*) *or* (1-Chloro-1,1-difluoroethane).	Flammable gas	UN2517	Flammable gas	173.306	173.304 173.314 173.315	Forbidden	300 pounds	1,2	1	
	Chlorodifluoromethane (*R-22*)	Nonflammable gas	UN1018	Nonflammable gas	173.306	173.304 173.314 173.315	150 pounds	300 pounds	1,2	1	
	Chlorodifluoro-methane and chlorpentafluoroethane mixture (*constant boiling mixture*) (*R-502*). *See* Refrigerant gas, n.o.s.										

EAW	Chloroform (*RQ-5000/2270*)	ORM-A	UN1888	None	173.505	173.620	10 gallons	55 gallons	1,2	1,2	Stow away from living quarters and foodstuffs
+	4-Chloro-o-toluidine hydrochloride	Poison B	UN1579	Poison	None	173.362	Forbidden	1 quart	1,2	1,2	
	Chloropentafluoroethane (*R-115*)	Nonflammable gas	UN1020	Nonflammable gas	173.306	173.304 173.314 173.315	150 pounds	300 pounds	1,2	1,2	
	3-Chloroperoxybenzoic acid, *not more than 86% with 3-chlorobenzoic acid See* Organic peroxide, solid, n.o.s.		UN2755								
	Chlorophenyltrichlorosilane	Corrosive material	UN1753	Corrosive	None	173.280	Forbidden	10 gallons	1	1	Keep dry
+	Chloropicrin, absorbed	Poison B	NA1583	Poison	None	173.357	Forbidden	Forbidden	1	5	Keep cool
+	Chloropicrin and methyl chloride mixture	Poison A	UN1582	Poison gas and flammable gas	None	173.329	Forbidden	Forbidden	1	5	Keep cool. Segregation same as for flammable gases
+	Choloropicrin and nonflammable, nonliquefied compressed gas mixture	Poison A	NA1955	Poison gas nonflammable gas	None	173.329	Forbidden	Forbidden	1	5	Keep cool
	Chloropicrin mixture, flammable (*pressure not exceeding 14.7 psia; flash point below 100° F*)	Poison B	NA2929	Poison and flammable liquid	None	173.357	Forbidden	Forbidden	1	5	Keep cool
+	Chloropicrin, liquid	Poison B	UN1580	Poison	None	173.357	Forbidden	Forbidden	1	5	Keep cool
+	Chloropicrin mixture (*containing no compressed gas or Poison A liquid*)	Poison B	UN1583	Poison	None	173.357	Forbidden	Forbidden	1	5	Keep cool
A	Chloroplatinic acid, solid	ORM-B	UN2507	None	173.505	173.800	25 pounds	100 pounds			
	Chloroprene, inhibited	Flammable liquid	UN1991	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Chloroprene, uninhibited	Forbidden									
	2-Chloropropene	Flammable liquid	UN2456	Flammable liquid	None	173.119	Forbidden	10 gallons	1,2	5	
E	Chlorosulfonic acid (*RQ-1000/454*)	Corrosive material	UN1754	Corrosive	173.244	173.254	1 quart	1 quart	1	1	Keep dry. Glass carboys not permitted on passenger vessels
E	Chlorosulfonic acid-sulfur trioxide mixture (*RQ-1000/454*)	Corrosive material	UN1754	Corrosive	173.144	173.254	1 quart	1 quart	1	1	Keep dry. Glass carboys not permitted on passenger vessels
	Chlorotetrafluoroethane (*R-124*)	Nonflammable gas	UN1021	Nonflammable gas	173.306	173.304 173.314	150 pounds	300 pounds	1,2	1,2	
	Chlorotrifluoromethane (*R-13*)	Nonflammable gas	UN1022	Nonflammable gas	173.306	173.304 173.314 173.315	150 pounds	300 pounds	1,2	1,2	
EA	Chlorpyrifos (*RQ-1/0.454*)	ORM-A	NA2783	None	173.505	173.510	100 pounds	No limit	1,2	1,2	
E	Chromic acetate (*RQ-1000/454*)	ORM-E	NA9101	None	None	173.510	No limit	No limit	1,2	1,2	
E	Chromic acid mixture, dry (*RQ-1000/454*)	Oxidizer	NA1463	Oxidizer	173.153	173.164	25 pounds	100 pounds	1,2	1,2	Stow away from foodstuffs
E	Chromic acid, solid (*RQ-1000/454*)	Oxidizer	NA1463	Oxidizer	173.153	173.164	25 pounds	100 pounds	1,2	1,2	Stow away from foodstuffs. Stow separate from flammable liquids and solids
E	Chromic acid solution (*RQ-1000/454*)	Corrosive material	UN1755	Corrosive	173.244	173.287	1 quart	1 gallon	1	1	
E	Chromic anhydride. *See* Chromic acid, solid										
	Chromic fluoride, solid	Corrosive material	UN1756	Corrosive	173.244	173.245b	25 pounds	100 pounds	1,2	1,2	
	Chromic fluoride solution	Corrosive material	UN1757	Corrosive	173.244	173.245	1 quart	1 gallon	1,2	1,2	
E	Chromic sulfate (*RQ-1000/454*)	ORM-E	NA9100	None	None	173.510	No limit	No limit	1,2	1,2	
E	Chromic trioxide. *See* Chromic acid, solid										
	Chromium oxychloride *or* Chromyl chloride	Corrosive material	UN1758	Corrosive	None	173.247	Forbidden	1 gallon	1	1	Keep dry. Glass carboys not permitted on passenger vessels
E	Chromous chloride (*RQ-1000/454*)	ORM-E	NA9102	None	None	173.510	No limit	No limit	1,2	1,2	

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Hazardous Materials Table—Continued

(1)	(2)	(3)	(3A)	(4)	(5) Packaging		(6) Maximum net quantity in one package		(7) Water shipments		
+/ E/ A/ W	Hazardous materials descriptions and proper shipping names	Hazard class	Identification number	Label(s) required (if not excepted)	(a) Exceptions	(b) Specific requirements	(a) Passenger carrying aircraft or railcar	(b) Cargo aircraft only	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Cigarette lighter (*or other similar ignition device*)	Flammable gas	UN1057	Flammable gas	173.21 175.10	173.308	21 ounces	25 pounds	1	1	
	Cigarette lighter (*or other similar ignition device*)	Flammable liquid	UN1226	Flammable liquid	173.21 175.10	173.110	Forbidden	Forbidden	1	1	
	Cigarette load	Class C explosive		Explosive C	None	173.111	50 pounds	150 pounds	1,2	1,2	
	Cloud gas cylinder. See Chemical ammunition, nonexplosive										
	Coal briquettes, hot	Forbidden									
	Coal facings. *See* Coal ground bituminous, etc.										
	Coal gas. See Hydrocarbon gas, nonliquefied										
	Coal, ground bituminous, sea coal *or* coal facings	Flammable solid	NA1361	Flammable solid	173.165	173.165	Forbidden	Forbidden	1	1	*Separate from flammable gases or liquids, oxidizing materials, or organic peroxides*
	Coal oil (*export shipment only*). *See* Kerosene										
	Coal tar distillate	Combustible liquid	UN1137	None	173.118a	None	No limit	No limit	1,2	1,2	
	Coal tar distillate	Flammable liquid	UN1136	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Coal tar dye, liquid (*not otherwise specifically named in 172.101*)	Corrosive material	NA2801	Corrosive	173.244	173.249a	1 quart	10 gallons	1,2	1,2	
	Coating solution	Flammable liquid	UN1139	Flammable liquid	173.118	173.132	1 quart	15 gallons	1,2	1	
E	Cobaltous bromide (*RQ-1000/454*)	ORM-E	NA9103	None	None	173.510	No limit	No limit	1,2	1,2	
E	Cobaltous formate (*RQ-1000/454*)	ORM-E	NA9104	None	None	173.510	No limit	No limit	1,2	1,2	
E	Cobaltous sulfamate (*RQ-1000/454*)	ORM-E	NA9105	None	None	173.510	No limit	No limit	1,2	1,2	
	Cobalt resinate, precipitated	Flammable solid	UN1318	Flammable solid	None	173.166	Forbidden	125 pounds	1,2	1,2	
	Cocculus, solid (*fishberry*)	Poison B	UN1584	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
W	Coconut meal pellets *containing at least 6% and not more than 13% moisture and not more than 10% residual fat content*	ORM-C		None	173.505	173.955			1,2	4	Keep dry
	Coke, hot	Forbidden									
	Collodion	Flammable liquid	NA2059	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Combination fuze	Class C explosive		Explosive C	None	173.105	50 pounds	150 pounds	1,3	1,3	
	Combination primer	Class C explosive		None	None	173.107	50 pounds	150 pounds	1,3	5	

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	Combustible liquid, n.o.s.	Combustible liquid	NA1993	None	173.118a	None	No limit	No limit	1,2	1,2	
	Commercial shaped charge. See High explosive										
	Common fireworks. *See* Fireworks, common										
	Compound, cleaning, liquid	Flammable liquid	NA1993	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Compound, cleaning, liquid	Corrosive material	NA1760	Corrosive	173.244	173.245	1 quart	1 quart	1,2	1,2	
	Compound, cleaning, liquid	Combustible liquid	NA1993	None	173.118a	None	No limit	No limit	1,2	1,2	
	Compound, cleaning, liquid (*containing phosphoric acid, acetic acid, sodium hydroxide or potassium hydroxide*)	Corrosive material	NA1760	Corrosive	173.244	173.249a	1 quart	1 quart	1,2	1,2	
	Compound, cleaning, liquid (containing hydrochloric (muriatic) acid)	Corrosive material	NA1789	Corrosive	173.244	173.263	1 quart	1 gallon	1	1	
	Compound, cleaning, liquid (containing hydrofluoric acid)	Corrosive material	NA1790	Corrosive	173.244	173.256	1 quart	1 gallon	1	4	
	Compound, polishing, liquid	Flammable liquid	NA1142	Flammable liquid	173.119	173.129	1 quart	55 gallons	1,2	1	
	Compound, rust preventing *or* Compound, rust removing	Corrosive material	NA1760	Corrosive	173.244	173.245	1 quart	1 gallon	1,2	1,2	
	Compound, tree *or* weed killing, liquid	Combustible liquid	NA1993	None	173.118a	None	No limit	No limit	1,2	1,2	
	Compound, tree *or* weed killing, liquid	Corrosive material	NA1760	Corrosive	173.244	173.245	1 quart	1 quart	1,2	1,2	
	Compound, tree *or* weed killing, liquid	Flammable liquid	NA1993	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Compound, tree *or* weed killing, liquid	Poison B	NA2810	Poison	173.345	173.346	1 quart	55 gallons	1,2	1,2	
	Compound, tree *or* weed killing, solid	Oxidizer	NA1479	Oxidizer	173.153	173.154 173.229	25 pounds	100 pounds			
	Compound, vulcanizing, liquid	Corrosive material	NA1760	Corrosive	173.244	173.245	1 quart	1 quart	1,2	1,2	
	Compound, vulcanizing, liquid	Flammable liquid	NA1142	Flammable liquid	173.118	172.119	1 quart	10 gallons	1,2	1	
	Compound, water treatment, liquid. *See* Water treatment, liquid										
	Compressed gas, n.o.s.	Flammable gas	UN1954	Flammable gas	173.306	173.302 173.304 173.305	Forbidden	300 pounds	1	4	
	Compressed gas, n.o.s.	Nonflammable gas	UN1956	Nonflammable gas	173.306 173.307	173.302 173.304 173.305	150 pounds	300 pounds	1,2	1,2	
	Consumer commodity	ORM-D		None	173.505(b)	173.510 173.1200	65 pounds gross	65 pounds gross			Not subject to requirements of Part 176
	Container, reused or empty, must be classed for the hazardous material previously contained. See 173.28, 173.29										
E	Copper acetoarsenite, solid (*RQ-100/45.4*)	Poison B	UN1585	Poison	173.364	173.367	50 pounds	200 pounds	1,2	1,2	
	Copper acetylide	Forbidden									
	Copper amine azide	Forbidden									
	Copper arsenite, solid	Poison B	UN1586	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
	Copper based pesticide, liquid, n.o.s. (*compounds and preparations*),	Flammable liquid	UN2776	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Copper based pesticide, liquid, n.o.s. (*compounds and preparations*),	Poison B	UN2775	Poison	173.345	173.346	1 quart	55 gallons	1,2	1,2	

Hazardous Materials Table—Continued

(1) +/E/A/W	(2) Hazardous materials descriptions and proper shipping names	(3) Hazard class	(3A) Identification number	(4) Label(s) required (if not excepted)	(5) Packaging (a) Exceptions	(5) Packaging (b) Specific requirements	(6) Maximum net quantity in one package (a) Passenger carrying aircraft or railcar	(6) Maximum net quantity in one package (b) Cargo aircraft only	(7) Water shipments (a) Cargo vessel	(7) Water shipments (b) Passenger vessel	(7) Water shipments (c) Other requirements
	Copper based pesticide, solid, n.o.s. *(compounds and preparations)*.	Poison B	UN2775	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
EA	Copper chloride (*RQ-10/4.54*)	ORM-B	UN2802	None	173.505	173.800	25 pounds	100 pounds	1,2	1,2	
	Copper cyanide	Poison B	UN1587	Poison	173.370	173.370	25 pounds	200 pounds	1,2	1,2	Stow away from acids
	Copper tetramine nitrate	Forbidden									
W	Copra	ORM-C	UN1363	None	173.505	173.960			1,2	1,2	Segregation same as for flammable solids. Separate from flammable gases or liquids, oxidizing materials, or organic peroxides
	Copra pellets. See Coconut meal pellets										
	Cord, detonating *flexible*	Class A explosive		Explosive A	173.81	172.81	Forbidden	Forbidden	6	5	
	Cord, detonating *flexible*	Class C explosive		Explosive C	None	173.104	Forbidden	150 pounds	1,3	1,3	
	Corrosive liquid, n.o.s.	Corrosive material	UN1760	Corrosive	173.244	173.245 173.245a	1 quart	1 quart	1	4	For material that meets only the corrosion to skin criteria of 49 CFR 173.240(a)(1), 'under deck' stowage is also authorized if the description includes the additional entry specified by 172.203(i)(2)
	Corrosive liquid, poisonous, n.o.s.	Corrosive material	UN2922	Corrosive and Poison	173.244	173.245	1 quart	1 quart	1	4	
	Corrosive solid, n.o.s.	Corrosive material	UN1759	Corrosive	173.244	173.245b	25 pounds	100 pounds	1	4	For material that meets only the corrosion to skin criteria of 49 CFR 173.240(a)(1), 'under deck' stowage is also authorized if the description includes the additional entry specified by 172.203(i)(2)
	Cosmetics, liquid, n.o.s.	Corrosive material	NA1760	Corrosive	173.244	173.245	1 quart	1 quart	1,2	1,2	
	Cosmetics, n.o.s.	Combustible liquid	NA1993	None	173.118a	None	No limit	No limit	1,2	1,2	
	Cosmetics, n.o.s.	Flammable liquid	NA1993	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Cosmetics, n.o.s.	Flammable solid	NA1325	Flammable solid	173.153	173.154	25 pounds	100 pounds	1,2	1,2	
	Cosmetics, n.o.s.	Oxidizer	NA1479	Oxidizer	173.153	173.154	25 pounds	100 pounds	1,2	1,2	
	Cosmetics, solid, n.o.s.	Corrosive material	NA1759	Corrosive	173.244	173.245b	25 pounds	100 pounds	1,2	1,2	Keep dry
W	Cotton	ORM-C		None	173.505	173.965			1,2	1,2	Segregation same as for flammable solids. See 176.900 to 176.904
E	Coumaphos (*RQ-10/4.54*)	Poison B	NA2783	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
E	Coumaphos mixture, liquid (*RQ-10/4.54*)	Poison B	NA2783	Poison	173.345	173.346	½ pint	1 quart	1,2	1,2	

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E	Cresol (*RQ-1000/454*)	Corrosive material	UN2076	Corrosive	173.244	173.245	1 quart	10 gallons	1,2	1,2	
E	Crotonaldehyde (*RQ-100/45.4*)	Flammable liquid	UN1143	Flammable liquid and Poison	None	173.119 173.3a	1 quart	1 gallon	1,2	1	
	Crotonic acid	Corrosive material	UN2823	Corrosive	173.244	173.245	1 quart	10 gallons	1,2	1,2	
	Crotonylene	Flammable liquid	UN1144	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,3	4	
	Crude oil, petroleum	Combustible liquid	UN1267	None	173.118a	None	No limit	No limit	1,2	1,2	
	Crude oil, petroleum	Flammable liquid	UN1267	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Cumene hydroperoxide	Organic peroxide	UN2116	Organic peroxide	173.153	173.224	1 quart	1 quart	1,2	4	
	Cumene hydroperoxide, *technically pure. See* Cumene hydroperoxide.		UN2116								
E	Cupric acetate (*RQ-100/45.4*)	ORM-E	NA9106	None	None	173.510	No limit	No limit	1,2	1,2	
	Cupric cyanide. See Copper cyanide										
E	Cupric nitrate (*RQ-100/45.4*)	Oxidizer	NA1479	Oxidizer	173.153	173.182	25 pounds	100 pounds	1,2	1,2	
E	Cupric oxalate (*RQ-100/45.4*)	ORM-E	NA2449	None	None	173.510	No limit	No limit	1,2	1,2	
E	Cupric sulfate (*RQ-10/4.54*)	ORM-E	NA9109	None	None	173.510	No limit	No limit	1,2	1,2	
E	Cupric sulfate, ammoniated (*RQ-100/45.4*)	ORM-E	NA9110	None	None	173.510	No limit	No limit	1,2	1,2	
E	Cupric tartrate (*RQ-100/45.4*)	ORM-E	NA9111	None	None	173.510	No limit	No limit	1,2	1,2	
	Cupriethylene-diamine solution	Corrosive material	UN1761	Corrosive	173.244	173.249	1 quart	1 gallon	1,2	1,2	
	Cyanide *or* cyanide mixture, dry	Poison B	UN1588	Poison	173.364	173.370	25 pounds	200 pounds	1,2	1,2	Keep dry. Stow away from acids
	Cyanide solution, n.o.s.	Poison B	UN1935	Poison	173.345	173.352	1 quart	55 gallons	1,2	1,2	Stow away from acids
	Cyanogen bromide	Poison B	UN1889	Poison	None	173.379	Forbidden	25 pounds	1	5	Shade from radiant heat. Segregation same as for corrosive materials
E	Cyanogen chloride *containing less than 0.9% water (RQ-10/4.54)*	Poison A	UN1589	Poison gas and Flammable gas	None	173.328	Forbidden	Forbidden	1	5	Shade from radiant heat
	Cyanogen gas	Poison A	UN1026	Poison gas and Flammable gas	None	173.328	Forbidden	Forbidden	1	5	Segregation same as for flammable gas
	Cyanuric triazide	Forbidden									
E	Cyclohexane (*RQ-1000/454*)	Flammable liquid	UN1145	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,3	4	
	Cyclohexanone peroxide, *50 to 85% peroxide*	Organic peroxide	UN2119	Organic peroxide	173.157	173.158	Forbidden	25 pounds	1	1	
	Cyclohexanone peroxide, *as a paste with not more than 9% by weight active oxygen. See* Cyclohexanone peroxide, *50 to 85% peroxide.*		UN2896								
	Cyclohexanone peroxide, *in solution with not more than 9% by weight active oxygen. See* Cyclohexanone peroxide, *50 to 85% peroxide*		UN2118								
	Cyclohexanone peroxide, *not over 50% peroxide*	Organic peroxide	UN2896	Organic peroxide	173.153	173.154	2 pounds	25 pounds	1,2	1,2	
	Cyclohexanone peroxide and di-(1-hydroxy cyclohexyl) peroxide mixture. *See appropriate cyclohexanone peroxide entry*										
	Cyclohexenyl trichlorosilane	Corrosive material	UN1762	Corrosive	None	173.280	Forbidden	10 gallons	1	1	Keep dry

Hazardous Materials Table—Continued

(1)	(2)	(3)	(3A)	(4)	(5) Packaging		(6) Maximum net quantity in one package		(7) Water shipments		
+ E A W	Hazardous materials descriptions and proper shipping names	Hazard class	Identification number	Label(s) required (if not excepted)	(a) Exceptions	(b) Specific requirements	(a) Passenger carrying aircraft or railcar	(b) Cargo aircraft only	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Cyclohexylamine	Flammable liquid	UN2357	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Cyclohexyl trichlorosilane	Corrosive material	UN1763	Corrosive	None	173.280	Forbidden	10 gallons	1	1	Keep dry
	Cyclopentane	Flammable liquid	UN1146	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,3	4	
	Cyclopentane, methyl	Flammable liquid	UN2298	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,3	4	
	Cyclopropane	Flammable gas	UN1027	Flammable gas	173.306	173.304	Forbidden	300 pounds	1,2	1	
	Cyclotetramethylene tetranitramine (dry) (HMX)	Forbidden									
	Cyclotetramethylene tetranitramine, wet with not less than 10% water. See High explosive										
	Cyclotrimethylene trinitramine, desensitized. See High explosive										
	Cyclotrimethylene trinitramine, wet with not less than 10% water. See High explosive										
	Cylinder, empty, including ton tanks, must be classed for the hazardous material previously contained in cylinder. See 173.29										
EA	2,4-D. *See* 2,4-Dichlorophenoxyacetic acid										
EA	DDT *or* Dichlorodiphenyltrichloroethane (*RQ-1/0.454*)	ORM-A	NA2761	None	173.505	173.510	No limit	No limit	1,2	1,2	
	Decaborane	Flammable solid	UN1868	Flammable solid and Poison	None	173.236	Forbidden	25 pounds	1,2	1,2	
	Decahydronaphthalene	Combustible liquid	UN1147	None	173.118a	None	No limit	No limit	1,2	1,2	
	Decalin. See Decahydronaphthalene										
	Decanoyl peroxide, *technically pure. See* Organic peroxide, solid, n.o.s.		UN2120								
	Delay connectors. See Detonators, Class A *or* Class C explosives *and* Detonating primers, Class A *or* Class C explosives										
	Delay electric igniter	Class C explosive		Explosive C	None	173.108	50 pounds	150 pounds	1,3	1,3	
	Denatured alcohol	Flammable liquid	NA1986	Flammable liquid	173.118	173.125	1 quart	10 gallons	1,2	1	
	Depth bomb. See Explosive bomb										

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EA	2,4-D ester *See* 2,4-Dichlorophenoxyacetic acid ester										
	Detonating fuze, Class A, *with or without radioactive components*	Class A explosive		Explosive A	None	173.69	Forbidden	Forbidden	6	5	
	Detonating fuze, Class C explosive	Class C explosive		Explosive C	None	173.113	50 pounds	150 pounds	1,3	1,3	
	Detonating primers, Class A explosives *See 173.53*	Class A explosive		Explosive A	None	173.68	Forbidden	Forbidden	6	5	Do not stow detonating primers, Class A explosives with any high explosives. Do not handle at the same time high explosives are being loaded.
	Detonating primers, Class C explosives *See 173.100*	Class C explosive		Explosive C	None	173.68	173.103(d)	150 pounds	1,2	1,2	The maximum net quantity in one pac^kage for this material shipped aboard passenger vessel is limited to 50 pounds. Must not be stowed in portable magazine for metal locker. Do not stow detonating primers, Class C explosives with high explosives. Do not handle at the same time high explosives are being loaded.
	Detonators, Class A explosives *See 173.53*	Class A explosive		Explosive A	None	173.66	Forbidden	Forbidden	6	..	Do not stow detonators, Class A with any high explosives. Do not handle at the same ttime high explosives are being loaded.
	Detonators, Class C explosives *See 173.100*	Class C explosive		Explosive C	None	173.66	173.103(d)	150 pounds	1,2	1,2	The maximum net quantity in one package for this material shipped aboard passenger vessel is limited to 50 pounds. Must be stowed in portable magazine or metal locker. Do not stow detonators, Class C explosives with high explosives. Do not handle at the same time high explosives are being loaded.
	Detonators, commercial *See* Detonators, Class A *or* Class C explosives										
	Di-(1-hydroxycyclohexyl) peroxide, *technically pure. See* Organic peroxide, solid, n.o.s.		UN2148								
	Di-(1-hydroxytetrazole) (dry)	Forbidden									
	Di-(1-naphthoyl)peroxide	Forbidden									
	Di-(2-ethylhexyl) peroxydicarbonate, *technically pure. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2122								
	Di-(2-ethylhexyl) peroxydicarbonate, *not more than 77% in solution. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2123								
	Di-(2-ethylhexyl) phosphoric acid	Corrosive material	NA1902	Corrosive	173.244	173.245	1 quart	10 gallons	1,2	1,2	
	Di-(2-methylbenzoyl)peroxide, *not more than 85% with water. See* Organic peroxide, solid, n.o.s.		UN2593								
	1,3-Di-(2-tert-butylperoxyisopropyl) benzene, *technically pure or more than 40% with inert solid. See* Organic peroxide, solid, n.o.s.		UN2112								
	1,3-Di-(2-tert-butylperoxyisopropyl) benzene and 1,4-Di-(2-tert-butylperoxyisopropyl) benzene mixture, *technically pure or more than 40% with inert solid. See* Organic peroxide, solid, n.o.s.		UN2112								

Hazardous Materials Table—Continued

(1)	(2)	(3)	(3A)	(4)	(5) Packaging		(6) Maximum net quantity in one package		(7) Water shipments		
+/E/A/W	Hazardous materials descriptions and proper shipping names	Hazard class	Identification number	Label(s) required (if not excepted)	(a) Exceptions	(b) Specific requirements	(a) Passenger carrying aircraft or railcar	(b) Cargo aircraft only	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	1,4-Di-(2-tert-butylperoxyisopropyl) benzene, *technically pure or more than 40% with inert solid.* *See* Organic peroxide, solid, n.o.s.		UN2112								
	Di-(3,5,5-trimethyl-1,2-dioxolanyl-3)peroxide, *not more than 50% as a paste, with phlegmatizer.* *See* Organic peroxide, solid, n.o.s.		UN2597								
	2,2-Di-(4,4-di-tert-butylperoxycyclohexyl)propane, *not more than 42% with inert solid.* *See* Organic peroxide, solid, n.o.s.		UN2168								
	2,2-Di-(4,4-di-tert-butylperoxycyclohexyl) propane, more than 42% with inert solid	Forbidden									
	Di-(4-tert-butylcyclohexyl)peroxydicarbonate, *technically pure.* *See* Organic peroxide, solid, n.o.s.		UN2154								
	Di-(4-tert-butylcyclohexyl)peroxydicarbonate, *not more than 42%, stable dispersion, in water.* *See* Organic peroxide, liquid or solution, n.o.s.		UN2894								
	Diacetone alcohol	Combustible liquid	UN1148	None	173.118a	None	No limit	No limit	1,2	1,2	
	Diacetone alcohol	Flammable liquid	UN1148	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Diacetone alcohol peroxide, *not more than 57% in solution with not more than 9% hydrogen peroxide, not less than 26% diacetone alcohol and not less than 9% water, total active oxygen content not more than 9%.* *See* Organic peroxide, liquid or solution, n.o.s.		UN2163								
	Diacetone alcohol peroxides, more than 57% in solution with more than 9% hydrogen peroxide, less than 26% diacetone alcohol and less than 9% water, total active oxygen content more than 9% by weight	Forbidden									
	Diacetyl	Flammable liquid	UN2346	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	

	p-Diazidobenzene	Forbidden									
	1,2-Diazidoethane	Forbidden									
EA	Diazinon (*RQ-1/0.454*)	ORM-A	NA2783	None	173.505	173.510	No limit	No limit	1,2	1,2	
	1,1'-Diazoaminonaphthalene	Forbidden									
	Diazoaminotetrazole (dry)	Forbidden									
	Diazodinitrophenol. *See* Initiating explosive										
	Diazodinitrophenol (dry)	Forbidden									
	Diazodiphenylmethane	Forbidden									
	Diazonium nitrates (dry)	Forbidden									
	Diazonium perchlorates (dry)	Forbidden									
	1,3-Diazopropane	Forbidden									
	Dibenzyl peroxydicarbonate, *not more than 87% with water. See* Organic peroxide, solid, n.o.s.		UN2149								
	Dibenzyl peroxydicarbonate, more than 87% with water	Forbidden									
	Di-(beta-nitroxyethyl)ammonium nitrate	Forbidden									
+	Diborane *or* diborane mixtures	Flammable gas	UN1911	Flammable gas and Poison	None	173.302	Forbidden	Forbidden	1	5	Separate from Chlorine and materials bearing the oxidizer label.
	Dibromoacetylene	Forbidden									
A	Dibromodifluoromethane	ORM-A	UN1941	None	173.505	173.655	10 gallons	55 gallons			
EAW	1,2-Dibromoethane. *See* Ethylene dibromide										
E	Dicamba (*RQ-1000/454*)	ORM-E	NA2769	None	None	173.510	No limit	No limit	1,2	1,2	
	Dicetyl peroxydicarbonate, *not more than 42%, stable dispersion, in water. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2895								
	Dicetyl peroxydicarbonate, *technically pure. See* Organic peroxide, solid, n.o.s.		UN2164								
E	Dichlobenil (*RQ-1000/454*)	ORM-E	NA2769	None	None	173.510	No limit	No limit	1,2	1,2	
E	Dichlone (*RQ-1/0.454*)	ORM-E	NA2761	None	None	173.510	No limit	No limit	1,2	1,2	
	N,N'-Dichlorazodicarbonamidine (salts of), (dry)	Forbidden									
E	*1,1-Dichloro-2,2-bis(parachlorophenyl) ethane. See* TDE										
	Dichloroacetic acid	Corrosive material	UN1764	Corrosive	173.244	173.245	1 quart	1 quart	1,2	1,2	Glass carboys in hampers not permitted under deck
	Dichloroacetyl chloride	Corrosive material	UN1765	Corrosive	173.244	173.247	1 quart	1 gallon	1	4	Keep dry
	Dichloroacetylene	Forbidden									
EA	Dichlorobenzene, ortho, liquid (*RQ-100/45.4*)	ORM-A	UN1591	None	173.505	173.510	No limit	No limit	1,2	1,2	
EA	Dichlorobenzene, para, solid (*RQ-100/45.4*)	ORM-A	UN1592	None	173.505	173.510	No limit	No limit	1,2	1,2	
	2,4-Dichlorobenzoyl peroxide, *not more than 75% with water. See* Organic peroxide, solid, n.o.s.		UN2137								
	2,4-Dichlorobenzoyl peroxide, *not more than 52% as a paste. See* Organic peroxide, solid, n.o.s.		UN2138								
	2,4-Dichlorobenzoyl peroxide, *not more than 52% in solution. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2139								
	2,4-Dichlorobenzoyl peroxide, more than 75% with water	Forbidden									

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Hazardous Materials Table—Continued

(1) +/E/A/W	(2) Hazardous materials descriptions and proper shipping names	(3) Hazard class	(3A) Identification number	(4) Label(s) required (if not excepted)	(5) Packaging (a) Exceptions	(5) Packaging (b) Specific requirements	(6) Maximum net quantity in one package (a) Passenger carrying aircraft or railcar	(6) Maximum net quantity in one package (b) Cargo aircraft only	(7) Water shipments (a) Cargo vessel	(7) Water shipments (b) Passenger vessel	(7) Water shipments (c) Other requirements
	Dichlorobutene	Flammable liquid	NA2924	Flammable liquid	173.118	173.119	10 gallons	1 quart	1,2	1	
	Dichlorobutene	Corrosive material	NA2924	Corrosive	173.244	173.245 173.245a	1 quart	10 gallons	1	4	
A	Dichlorodifluoroethylene	ORM-A	NA9018	None	173.505	173.605	10 gallons	55 gallons			
	Dichlorodifluoromethane (*R-12*)	Nonflammable gas	UN1028	Nonflammable gas	173.300	173.304 173.314 173.315	150 pounds	300 pounds	1,2	1,2	
	Dichlorodifluoromethane and difluoroethane mixture (*constant boiling mixture*) (*R-500*). *See* Refrigerant gas, n.o.s. *or* Dispersant gas, n.o.s.										
	Dichlorodifluoromethane (*R-12*) and dichlorotetrafluoroethane (*R-114*) mixture. *See* Refrigerant gas, n.o.s. *or* Dispersant gas, n.o.s.										
	Dichlorodifluoromethane (*R-12*) and chlordifluoromethane (*R-22*) mixture. *See* Refrigerant gas, n.o.s. *or* Dispersant gas, n.o.s.										
	Dichlorodifluoromethane (*R-12*) and trichlorofluoromethane (*R-11*) mixture. *See* Refrigerant gas, n.o.s. *or* Dispersant gas, n.o.s.										
	Dichlorodifluoromethane (*R-12*) and trichlorofluoromethane (*R-11*) and chlorodifluoromethane (*R-22*) mixture. *See* Refrigerant gas, n.o.s. *or* Dispersant gas, n.o.s.										
	Dichlorodifluoromethane (*R-12*) and trichlorotrifluoroethane (*R-113*) mixture. *See* Refrigerant gas, n.o.s. *or* Dispersant gas, n.o.s.										
EA	Dichlorodiphenyltrichloroethane. *See* DDT										
	Dichloroethylene	Flammable liquid	UN1150	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Dichloroisopropyl ether	Corrosive material	UN2490	Corrosive	173.244	173.245	1 quart	10 gallons	1,2	1,2	
A	Dichloromethane *or* Methylene chloride	ORM-A	UN1593	None	173.505	173.605	10 gallons	55 gallons			
	Dichloropentane	Flammable liquid	UN1152	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1,2	

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EA	2,4-Dichlorophenoxyacetic acid (*RQ-100/45.4*)	ORM-A	NA2765	None	173.505	173.510	50 pounds	No limit	1,2	1,2	
E	2,4-Dichlorophenoxyacetic acid ester (*RQ-100/45.4*)	ORM-E	NA2765	None	None	173.510	No limit	No limit	1,2	1,2	
	Dichlorophenyltrichlorosilane	Corrosive material	UN1766	Corrosive	None	173.280	Forbidden	10 gallons	1	1	Keep dry
E	Dichloropropane. *See* Propylene dichloride										
E	Dichloropropene (*RQ-5000/2270*)	Flammable liquid	UN2047	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Dichloropropene and propylene dichloride mixture	Flammable liquid	NA2047	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
E	2,2-Dichloropropionic acid (*RQ-5000/2270*)	Corrosive material	NA1760	Corrosive	173.244	173.245	1 quart	10 gallons	1,2	1,2	
E	Dichlorvos (*RQ-10/4.54*)	Poison B	NA2783	Poison	173.345	173.346	Forbidden	1 quart	1,2	1,2	
E	Dichlorvos mixture, dry (*RQ-10/4.54*)	Poison B	NA2783	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
	Dicumyl peroxide *50% solution*	Organic peroxide	NA2121	Organic peroxide	173.155	173.224	1 quart	1 quart	1,2	4	
	Dicumyl peroxide, *technically pure or* Dicumyl peroxide, *with inert solid. See* Dicumyl peroxide, dry.		UN2121								
	Dicumyl peroxide, dry	Organic peroxide	UN2121	Organic peroxide	173.153	173.154	2 pounds	25 pounds	1,2	1,2	
	Dicyclohexyl peroxydicarbonate, *technically pure. See* Organic peroxide, solid, n.o.s.		UN2152								
	Dicyclohexyl peroxydicarbonate, *not more than 91% with water. See* Organic peroxide, solid, n.o.s.		UN2153								
EA	Dieldrin (*RQ-1/0.454*)	ORM-A	NA2761	None	173.505	173.510	No limit	No limit	1,2	1,2	
	Diesel fuel. *See* Fuel oil										
	Diethanol nitrosamine dinitrate (dry)	Forbidden									
E	Diethylamine (*RQ-1000/454*)	Flammable liquid	UN1154	Flammable liquid	173.118	173.119	Forbidden	5 pints	1,3	4	
	Diethyl cellosolve. *See* Ethylene glycol diethyl ether										
	Diethyl dichlorosilane	Flammable liquid	UN1767	Flammable liquid	None	173.135	Forbidden	10 gallons	1	1	Keep dry. Segregation same as for corrosives
	Diethylene glycol dinitrate. See 173.51	Forbidden									
	Diethylgold bromide	Forbidden									
	Diethyl ketone	Flammable liquid	UN1156	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Diethyl peroxydicarbonate, *not more than 27% in solution. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2175								
	Diethyl peroxydicarbonate, more than 27% in solution	Forbidden									
	Diethylzinc. See Pyrophic liquid, n.o.s.										
	Difluoroethane (*R-152a*)	Flammable gas	UN1030	Flammable gas	173.306	173.304 173.314 173.315	Forbidden	300 pounds	1,2	1,2	
	Difluorophosphoric acid, anhydrous	Corrosive material	UN1768	Corrosive	None	173.275	Forbidden	1 gallon	1,2	1,2	
	2,2-Dihydroperoxy propane, *not more than 25% with inert organic solid. See* Organic peroxide, solid, n.o.s.		UN2178								
	Dihydropyran	Flammable liquid	UN2376	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	4	

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Hazardous Materials Table—Continued

(1)	(2)	(3)	(3A)	(4)	(5) Packaging		(6) Maximum net quantity in one package		(7) Water shipments		
+ E A W	Hazardous materials descriptions and proper shipping names	Hazard class	Identification number	Label(s) required (if not excepted)	(a) Exceptions	(b) Specific requirements	(a) Passenger carrying aircraft or railcar	(b) Cargo aircraft only	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	1,8-Dihydroxy-2,4,5,7-tetranitroanthraquinone (chrysamminic acid)	Forbidden									
	Diiodoacetylene	Forbidden									
	Diisobutyl ketone	Combustible liquid	UN1157	None	173.118a	None	No limit	No limit	1,2	1,2	
	Diisobutyryl peroxide, *not more than 52% in solution. See* Organic peroxide, liquid *or* solution, n.o.s.		UN21[illegible]								
	Diisooctyl acid phosphate	Corrosive material	UN1902	Corrosive	173.144	173.296	1 quart	1 quart	1,2	1,2	Glass carboys in hampers not permitted under deck
	Diisopropylamine	Flammable liquid	UN1158	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Diisopropylbenzene hydroperoxide solution, *not over 72% peroxide*	Organic peroxide	UN2171	Organic peroxide	173.153	173.224	1 quart	1 quart	1,2	4	
	Diisopropylbenzene hydroperoxide, *not more than 72% in solution. See* Diisopropylbenzene hydroperoxide solution, *not more than 72% peroxide.*		UN2171								
	Diisopropylbenzene hydroperoxide, more than 72% in solution	Forbidden									
	Diisopropyl ether	Flammable liquid	UN1159	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,3	4	
	Diisotridecyl peroxydicarbonate, *technically pure. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2889								
	2,5-Dimethyl-2,5-di-(2-ethylhexanoylperoxy)hexane, *technically pure. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2157								
	2,5-Dimethyl-2,5-di-(benzoylperoxy)hexane, *technically pure. See* Organic peroxide, solid, n.o.s.		UN2172								
	2,5-Dimethyl-2,5-di-(benzoylperoxy)hexane, *not more than 82% with inert solid. See* Organic peroxide, solid, n.o.s.		UN2173								
	2,5-Dimethyl-2,5-dihydroperoxy hexane, *not more than 82% with water. See* Dimethylhexane dihydroperoxide, *with 18% or more water.*		UN2174								

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	2,5-Dimethyl-2,5-dihydroperoxy hexane, more than 82% with water	Forbidden									
	2,5-Dimethyl-2,5-di-(tert-butylperoxy)hexane, *technically pure. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2155								
	2,5-Dimethyl-2,5-di-(tert-butylperoxy)hexane, *not more than 52% with inert solid. See* Organic peroxide, solid n.o.s.		UN2156								
	2,5-Dimethyl-2,5-di-(tert-butylperoxy)hexyne-3, *technically pure. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2158								
	2,5-Dimethyl-2,5-di-(tert-butylperoxy)hexyne-3, *not more than 52% with inert solid. See* Organic peroxide, solid, n.o.s.		UN2159								
+ E	Dimethylamine, anhydrous (*RQ-1000/454*)	Flammable gas	UN1032	Flammable gas	173.306	173.304 173.314 173.315	Forbidden	300 pounds	1,2	4	
E	Dimethylamine, aqueous solution (*RQ-1000/454*)	Flammable liquid	UN1160	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	2,3-Dimethylbutane	Flammable liquid	UN2457	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,3	4	
	Dimethyl carbonate	Flammable liquid	UN1161	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Dimethyl chlorothiophosphate	Corrosive material	NA2922	Corrosive	173.244	173.245	1 quart	1 quart	1,2	1,2	
	1,4-Dimethylcyclohexane	Flammable liquid	UN2263	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Dimethyldichlorosilane	Flammable liquid	UN1162	Flammable liquid	None	173.135	Forbidden	5 pints	1,2	1	
+	Dimethyl ether	Flammable gas	UN1033	Flammable gas	173.306	173.304 173.314 173.315	Forbidden	300 pounds	1,2	1	
	Dimethylhexane dihydroperoxide (dry)	Forbidden									
	Dimethylhexane dihydroperoxide, (with 18% or more water)	Organic peroxide	UN2174	Organic peroxide	None	173.157	Forbidden	25 pounds	1	1	
	Dimethylhydrazine, unsymmetrical (*UDMH*)	Flammable liquid	UN1163	Flammable liquid and Poison	None	173.145	Forbidden	5 pints	1,2	1	Keep dry. Separate from corrosive and oxidizing materials, and organic peroxides.
	Dimethyl phosphorochloridothioate. *See* Dimethyl clorothiophosphate.										
	Dimethyl sulfate	Corrosive material	UN1595	Corrosive	None	173.255	Forbidden	1 quart	1	5	Keep cool
	Dimethyl sulfide	Flammable liquid	UN1164	Flammable liquid	None	173.119	Forbidden	10 gallons	1,2	5	
	Dimyristyl peroxydicarbonate, *technically pure. See* Organic peroxide, solid, n.o.s.		UN2595								
	Dimyristyl peroxydicarbonate, *not more than 22%, stable dispersion, in water. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2892								
	1,4-Dinitro-1,1,4,4-tetramethylolbutanetetranitrate (dry)	Forbidden									
	2,4-Dinitro-1,3,5-trimethylbenzene	Forbidden									

Hazardous Materials Table—Continued

(1)	(2)	(3)	(3A)	(4)	(5) Packaging		(6) Maximum net quantity in one package		(7) Water shipments		
* E A W	Hazardous materials descriptions and proper shipping names	Hazard class	Identification number	Label(s) required (if not excepted)	(a) Exceptions	(b) Specific requirements	(a) Passenger carrying aircraft or railcar	(b) Cargo aircraft only	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	1,3-Dinitro-4,5-dinitrosobenzene	Forbidden									
	1,3-Dinitro-5,5-dimethyl hydantoin	Forbidden									
	Dinitro-7,8-dimethylglycoluril (dry)	Forbidden									
E	Dinitrobenzene, solid, or Dinitrobenzol, solid (*RQ-1000/454*)	Poison B	UN1597	Poison	173.364	173.371	50 pounds	200 pounds	1,2	1,2	
E	Dinitrobenzene solution (*RQ-1000/454*)	Poison B	UN1597	Poison	173.345	173.346	1 quart	55 gallons	1,2	1,2	
	Dinitrochlorobenzene	Poison B	UN1577	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
A	Dinitrocyclohexylphenol	ORM-A	NA9026	None	173.505	173.510	No limit	No limit			
	1,2-Dinitroethane	Forbidden									
	1,1-Dinitroethane (dry)	Forbidden									
	Dinitroglycoluril	Forbidden									
	Dinitromethane	Forbidden									
E	Dinitrophenol solution (*RQ-1000/454*)	Poison B	UN1599	Poison	173.345	173.362a	1 quart	65 pounds	1,2	1,2	Stow away from heavy metals and their compounds. If flash point is 141 deg F or less segregation same as for flammable liquids
	Dinitropropylene glycol	Forbidden									
	2,4-Dinitroresorcinol (heavy metal salts of), (dry)	Forbidden									
	4,6-Dinitroresorcinol (heavy metal salts of), (dry)	Forbidden									
	3,5-Dinitrosalicylic acid (lead salt), (dry)	Forbidden									
	Dinitrosobenzylamidine and salts of (dry)	Forbidden									
	2,2-Dinitrostilbene	Forbidden									
E	Dinitrotoluene, liquid (*RQ-1000/454*)	ORM-E	UN1600	None	None	173.510	No limit	No limit	1,2	1,2	
E	Dinitrotoluene, solid (*RQ-1000/454*)	ORM-E	UN2038	None	None	173.510	No limit	No limit	1,2	1,2	
	a,a'-Di-(nitroxy)methylether	Forbidden									
	1,9-Dinitroxy pentamethylene-2,4,6,8-tetramine (dry)	Forbidden									
	Di-n-propyl peroxydicarbonate, *technically pure*. *See* Organic peroxide, liquid, n.o.s.		UN2176								
	Dioxane	Flammable liquid	UN1165	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Dioxolane	Flammable liquid	UN1166	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Diphenylaminechloroarsine (*DM*)	Irritating material	UN1698	Irritant	None	173.382	Forbidden	75 pounds	1	5	
	Diphenyl dichlorosilane	Corrosive material	UN1769	Corrosive	None	173.280	Forbidden	10 gallons	1	1	
	Diphenyl methyl bromide, solid	Corrosive material	UN1770	Corrosive	173.244	173.245b	25 pounds	100 pounds	1	4	

	Diphenyl methyl bromide solution	Corrosive material	UN1770	Corrosive	173.244	173.247	1 quart	1 gallon	1,2	1,2
	Diphosgene. See Phosgene									
E	Diquat (*RQ-1000/454*)	ORM-E	NA2781	None	None	173.510	No limit	No limit	1,2	1,2
	Di-sec-butyl peroxydicarbonate, *technically pure. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2150							
	Di-sec-butyl peroxydicarbonate, *not more than 32% in solution. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2151							
	Disinfectant, liquid	Corrosive material	UN1903	Corrosive	173.244	173.245	1 quart	10 gallons	1	4
	Disinfectant, liquid	Poison B	UN1601	Poison	173.345	173.346	1 quart	55 gallons	1,2	1
	Disinfectant, liquid, n.o.s.	Combustible liquid	NA1993	None	173.118a	None	No limit	No limit	1,2	1,2
	Disinfectant, solid	Poison B	UN1601	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1
	Dispersant gas, n.o.s. *See* Refrigerant gas, n.o.s.									
	Distearyl peroxydicarbonate, *not more than 85% with stearyl alcohol. See* Organic peroxide, solid, n.o.s.		UN2592							
E	Disulfoton (*RQ-1/0.454*)	Poison B	NA2783	Poison	None	173.358	Forbidden	1 quart	1,2	5
E	Disulfoton mixture, dry (*RQ-1/0.454*)	Poison B	NA2783	Poison	173.377	173.377	Forbidden	200 pounds	1,2	4
E	Disulfoton mixture, liquid (*RQ-1/0.454*)	Poison B	NA2783	Poison	173.359	173.359	½ pint	1 quart	1,2	5
	Di-tert-butyl peroxide, *technically pure. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2102							
	1,1-Di-(tert-butylperoxy)-3,3,5-trimethyl cyclohexane, *technically pure. See* Organic peroxide, liquid *or* solution n.o.s.		UN2145							
	1,1-Di-(tert-butylperoxy)-3,3,5-trimethyl cyclohexane, *not more than 57% in solution. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2146							
	1,1-Di-(tert-butylperoxy)-3,3,5-trimethyl cyclohexane, *not more than 58% with inert solid. See* Organic peroxide, solid, n.o.s.		UN2147							
	2,2-Di-(tert-butylperoxy)butane, *not more than 55% in solution. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2111							
	2,2-Di-(tert-butylperoxy) butane, more than 55% in solution	Forbidden								
	1,1-Di-(tert-butylperoxy)cyclohexane, *technically pure. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2179							
	1,1-Di-(tert-butylperoxy)cyclohexane, *not more than 77% in solution. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2180							
	1,2-Di-(tert-butylperoxy)cyclohexane, *not more than 77% in solution. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2181							
	1,1-Di-(tert-butylperoxy)cyclohexane, *not more than 40% with inert inorganic solid, with not less than 13% phlegmatizer. See* Organic peroxide, solid, n.o		UN2885							

Hazardous Materials Table—Continued

(1)	(2)	(3)	(3A)	(4)	(5) Packaging		(6) Maximum net quantity in one package		(7) Water shipments		
+ E A W	Hazardous materials descriptions and proper shipping names	Hazard class	Identification number	Label(s) required (if not excepted)	(a) Exceptions	(b) Specific requirements	(a) Passenger carrying aircraft or railcar	(b) Cargo aircraft only	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	1,1-Di-(tert-butylperoxy)cyclohexane, *not more than 50% with phlegmatizer. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2897								
	Di-(tert-butylperoxy) phthalate, more than 55% in solution	Forbidden									
	Di-(tert-butylperoxy)phthalate, *technically pure. See* Organic peroxide, solid, n.o.s.		UN2106								
	Di-(tert-butylperoxy)phthalate, *not more than 55% in solution. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2107								
	Di-(tert-butylperoxy)phthalate, *not more than 55% as a paste. See* Organic peroxide, solid, n.o.s.		UN2108								
	2,2-Di-(tert-butylperoxy)propane, *not more than 50% with phlegmatizer. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2883								
	2,2-Di-(tert-butylperoxy)propane, *not more than 40% with inert inorganic solid with not less than 13% phlegmatizer. See* Organic peroxide, solid, n.o.s.		UN2884								
	Dithiocarbamate pesticide, liquid, n.o.s. *(compounds and preparations)*,	Flammable liquid	UN2772	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Dithiocarbamate pesticide, liquid, n.o.s.*(compounds and preparations)*,	Poison B	UN2771	Poison	173.345	173.346	1 quart	55 gallons	1,2	1,2	
	Dithiocarbamate pesticide, solid, n.o.s. *(compounds and preparations)*,	Poison B	UN2771	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
E	Duron (*RQ-100/45.4*)	ORM-E	NA2767	None	None	173.510	No limit	No limit	1,2	1,2	
	Divinyl ether	Flammable liquid	UN1167	Flammable liquid	None	173.119	Forbidden	10 gallons	1,3	5	
E	Dodecylbenzenesulfonic acid (*RQ-1000/454*)	Corrosive material	NA2584	Corrosive	173.244	173.245	1 quart	10 gallons	1,2	1,2	
	Dodecyl trichlorosilane	Corrosive material	UN1771	Corrosive	None	173.280	Forbidden	10 gallons	1	1	Keep dry
	Driers, paint *or* varnish, liquid, n.o.s	Combustible liquid	UN1168	None	173.118a	None	No limit	No limit	1,2	1,2	
	Driers, paint *or* varnish, liquid, n.o.s	Flammable liquid	UN1168	Flammable liquid	173.118 173.128	173.128	1 quart	55 gallons	1,2	1	
	Drill cartridge. See 173.55										
	Drugs, n.o.s.	Combustible liquid	NA1993	None	173.118a	None	No limit	No limit	1,2	1,2	

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	Drugs, n.o.s.	Flammable solid	NA1325	Flammable solid	173.153	173.154	25 pounds	100 pounds	1,2	1,2	
	Drugs, n.o.s.	Oxidizer	NA1479	Oxidizer	173.153	173.154	25 pounds	100 pounds	1,2	1,2	
	Drugs, n.o.s.	Flammable liquid	NA1993	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Drugs, liquid, n.o.s.	Corrosive material	NA1760	Corrosive	173.244	173.245	1 quart	1 quart	1,2	1,2	
	Drugs, liquid, n.o.s.	Poison B	NA2810	Poison	173.345	173.346	1 quart	55 gallons	1,3	1	
	Drugs, solid, n.o.s.	Corrosive material	NA1759	Corrosive	173.244	173.245b	25 pounds	100 pounds	1,2	1,2	Keep dry
	Drugs, solid, n.o.s.	Poison B	NA2811	Poison	173.364	173.365	50 pounds	200 pounds	1,3	1,3	
	Drums, empty, must be classed for the hazardous material previously contained in drum. See 173.29										
	Dry ice. *See* Carbon dioxide, solid										
	Dye intermediate, liquid	Corrosive material	UN2801	Corrosive	173.244	173.249a	1 quart	10 gallons	1,2	1,2	Stow away from foodstuffs and living quarters
	Dynamite. See High explosive										
E	EDTA. *See* Ethylenediaminetetraacetic acid										
	Electric blasting caps. See Detonators, Class A *or* Class C explosives										
	Electric squib	Class C explosive		Explosive C	None	173.108	50 pounds	150 pounds	1,3	1,3	
E	Electrolyte (acid) battery fluid (*not over 47% acid*) (*RQ-1000/454*). *See* Battery fluid, acid										
	Empty cartridge bag with black powder igniter	Class C explosive		Explosive C	None	173.106	50 pounds	150 pounds	1,3	1,3	
	Empty cartridge case, primed	Class C explosive		Explosive C	None	173.107	50 pounds	150 pounds	1,3	1,3	
E	Endosulfan (*RQ-1/0.454*)	Poison B	NA2761	Poison	173.364	173.365	1 pound	10 pounds	1,2	1,2	If stowed under deck, must be stowed in a recoverable location.
E	Endosulfan mixture, liquid (*RQ-1/0.454*)	Poison B	NA2761	Poison	173.345	173.346	1 quart	55 gallons	1,2	1,2	
E	Endrin (*RQ-1/0.454*)	Poison B	NA2761	Poison	173.364	173.365	1 pounds	10 pounds	1,2	1,2	If stowed under deck, must be stowed in a recoverable location.
E	Endrin mixture, liquid (*RQ-1/0.454*)	Poison B	NA2761	Poison	173.345	173.346	1 quart	55 gallons	1,2	1,2	
	Engine, internal combustion				173.120						
	Engine starting fluid	Flammable gas	UN1960	Flammable gas	None	173.304	Forbidden	60 pounds	1,2	5	
E	Epichlorohydrin (*RQ-1000/454*)	Flammable liquid	UN2023	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1,2	
	Escape *or* Evacuation slide, inflatable. *See* Life rafts, inflatable										
E	Etching acid, liquid, n.o.s. (*RQ-1000/454*)	Corrosive material	NA1790	Corrosive	None	173.299	Forbidden	10 pounds	1	5	
+	Ethane *or* Ethane, compressed	Flammable gas	UN1035	Flammable gas	173.306	173.304	Forbidden	300 pounds	1,2	4	Stow away from living quarters
	Ethane, refrigerated liquid	Flammable gas	UN1961	Flammable gas	None	173.315	Forbidden	Forbidden	1	5	Stow away from living quarters
	Ethane-Propane mixture, refrigerated liquid	Flammable gas	UN1961	Flammable gas	None	173.315	Forbidden	Forbidden	1	5	Stow away from living quarters
	Ethanol. *See* Ethyl alcohol										
	Ethanol amine dinitrate	Forbidden									
E	Ethion (*RQ-10/4.54*)	Poison B	NA2783	Poison	173.345	173.346	Forbidden	1 quart	1,2	1,2	
E	Ethion mixture, dry(*RQ-10/4.54*)	Poison B	NA2783	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	

Hazardous Materials Table—Continued

(1)	(2)	(3)	(3A)	(4)	(5) Packaging		(6) Maximum net quantity in one package		(7) Water shipments		
+/ E/ A/ W	Hazardous materials descriptions and proper shipping names	Hazard class	Identification number	Label(s) required (if not excepted)	(a) Exceptions	(b) Specific requirements	(a) Passenger carrying aircraft or railcar	(b) Cargo aircraft only	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Ethyl-3,3-di-(tert-butylperoxy)butyrate, *technically pure. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2184								
	Ethyl-3,3-di-(tert-butylperoxy)butyrate, *not more than 77% in solution. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2185								
	Ethyl-3,3-di-(tert-butylperoxy)butyrate, *not more than 50% with inert inorganic solid. See* Organic peroxide, solid, n.o.s.		UN2598								
	Ethyl acetate	Flammable liquid	UN1173	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Ethyl acrylate, inhibited	Flammable liquid	UN1917	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Ethyl alcohol	Flammable liquid	UN1170	Flammable liquid	173.118	173.125	1 quart	10 gallons	1,2	1	
E	Ethyl aldehyde. *See* Acetaldehyde										
E	Ethyl benzene (*RQ-1000/454*)	Flammable liquid	UN1175	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Ethyl borate	Flammable liquid	UN1176	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	Keep dry
	Ethyl butyl acetate	Combustible liquid	UN1177	None	173.118a	None	No limit	No limit	1,2	1,2	
	Ethyl butyl ether	Flammable liquid	UN1179	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Ethyl butyraldehyde	Flammable liquid	UN1178	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Ethyl butyrate	Flammable liquid	UN1180	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1,2	
	Ethyl chloride	Flammable liquid	UN1037	Flammable liquid	None	173.123	Forbidden	See 173.123	1,2	1	Segregation same as for flammable gases
	Ethyl chloroacetate	Combustible liquid	UN1181	None	173.118a	None	No limit	No limit	1,2	1,2	
	Ethyl chloroformate (*chlorocarbonate*)	Flammable liquid	UN1182	Flammable liquid and Poison	None	173.288	Forbidden	5 pints	1,2	1	
	Ethyl chlorothioformate	Corrosive material	UN2826	Corrosive	173.244	173.245 173.245a	1 quart	1 quart	1,2	1	
	Ethyl crotonate	Flammable liquid	UN1862	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Ethyl dichlorosilane	Flammable liquid	UN1183	Flammable liquid	None	173.135	Forbidden	5 pints	1,2	1	

+	Ethylene *or* Ethylene, compressed	Flammable gas	UN1962	Flammable gas	173.306	173.304	Forbidden	300 pounds	1,2	4	Stow away from living quarters
	Ethylene, refrigerated liquid (*cryogenic liquid*)	Flammable gas	UN1038	Flammable gas	None	173.318 173.319	Forbidden	Forbidden	1	5	Stow away from living quarters
	Ethylene chlorohydrin	Poison B	UN1135	Poison	173.345	173.346 173.3a	1 quart	55 gallons	1,2	1	Segregation same as for flammable liquids
E	Ethylenediamine (*RQ-1000/454*)	Corrosive material	UN1604	Corrosive	173.244	173.245	1 quart	1 quart	1,2	1,2	
	Ethylene diamine diperchlorate	Forbidden									
E	Ethylenediaminetetraacetic acid (*RQ-5000/2270*)	ORM-E	NA9117	None	None	173.510	No limit	No limit	1,2	1,2	
EAW	Ethylene dibromide (*RQ-1000/454*)	ORM-A	UN1605	None	173.505	173.620	1 quart	55 gallons	1,2	1,2	
E	Ethylene dichloride (*RQ-5000/2270*)	Flammable liquid	UN1184	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	Stow away from living quarters
	Ethylene glycol diethyl ether (*diethyl 'Cellosolve'*)	Combustible liquid	UN1153	None	173.118a	None	No limit	No limit	1,2	1,2	
	Ethylene glycol dinitrate	Forbidden									
	Ethylene glycol monoethyl ether (*'Cellosolve'*)	Combustible liquid	UN1171	None	173.118a	None	No limit	No limit	1,2	1,2	
	Ethylene glycol monoethyl ether acetate (*'Cellosolve acetate'*)	Combustible liquid	UN1172	None	173.118a	None	No limit	No limit	1,2	1,2	
	Ethylene glycol monomethyl ether (*methyl 'Cellosolve'*)	Combustible liquid	UN1188	None	173.118a	None	No limit	No limit	1,2	1,2	
	Ethylene glycol monomethyl ether acetate (*methyl 'Cellosolve acetate'*)	Combustible liquid	UN1189	None	173.118a	None	No limit	No limit	1,2	1,2	
	Ethylene imine, inhibited	Flammable liquid	UN1185	Flammable liquid and Poison	None	173.139	Forbidden	5 pints	1,2	1	
	Ethylene oxide	Flammable liquid	UN1040	Flammable liquid	None	173.124	Forbidden	See 173.124	1,2	1	Segregation same as for flammable gases
	Ethyl ether	Flammable liquid	UN1155	Flammable liquid	None	173.119	Forbidden	10 gallons	1,3	5	
	Ethyl formate	Flammable liquid	UN1190	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,3	4	
	Ethylhexaldehyde	Combustible liquid	UN1191	None	173.118a	None	No limit	No limit	1,2	1,2	
	Ethyl hydroperoxide (explodes above 100 deg C)	Forbidden									
	Ethyl lactate	Combustible liquid	UN1192	None	173.118a	None	No limit	No limit	1,2	1,2	
	Ethyl mercaptan	Flammable liquid	UN2363	Flammable liquid	None	173.141	Forbidden	10 gallons	1,2	1	
	Ethyl methyl ether	Flammable liquid	UN1039	Flammable liquid	None	173.119	Forbidden	10 gallons	1,3	1	Segregation same as for flammable gases
	Ethyl methyl ketone	Flammable liquid	UN1193	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Ethyl nitrate (*nitric ether*)	Flammable liquid	NA1993	Flammable liquid	173.118	173.119	Forbidden	Forbidden	1,2	1	
	Ethyl nitrite (nitrous ether)	Flammable liquid	UN1194	Flammable liquid	None	173.119	Forbidden	Forbidden	1,3	5	
	Ethyl perchlorate	Forbidden									
	Ethyl phenyl dichlorosilane	Corrosive material	UN2435	Corrosive	None	173.280	Forbidden	10 gallons	1	5	
	Ethyl phosphonous dichloride. *See* Pyroforic liquid, n.o.s										
	Ethyl phosphorodichloridate	Corrosive material	NA1760	Corrosive	173.244	173.245 173.245a	1 quart	1 quart	1	4	

Hazardous Materials Table—Continued

(1)	(2)	(3)	(3A)	(4)	(5) Packaging		(6) Maximum net quantity in one package		(7) Water shipments		
+ E A W	Hazardous materials descriptions and proper shipping names	Hazard class	Identification number	Label(s) required (if not excepted)	(a) Exceptions	(b) Specific requirements	(a) Passenger carrying aircraft or railcar	(b) Cargo aircraft only	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Ethyl propionate	Flammable liquid	UN1195	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Ethyl silicate (*tetraethyl orthosilicate*)	Combustible liquid	UN1292	None	173.118a	None	No limit	No limit	1,2	1,2	
	Ethyl trichlorosilane	Flammable liquid	UN1196	Flammable liquid	None	173.135	Forbidden	5 pints	1,2	1	
	Etiologic agent, n.o.s.	Etiologic agent	NA2814	Etiologic agent	173.386	173.387	See 173.386	4 liters			Not permitted except under specific conditions approved by the Department
	Explosive auto alarm	Class C explosive		Explosive C	None	173.111	50 pounds	150 pounds	1,2	1,2	
	Explosive bomb	Class A explosive		Explosive A	None	173.56	Forbidden	Forbidden	1,2	5	Magazine stowage authorized. No other cargo may be stowed in the same hold with these items
	Explosive cable cutter	Class C explosive		Explosive C	None	173.102	50 pounds	150 pounds	1,3	1,3	
	Explosive, forbidden. See Sec. 173.51	Forbidden									
	Explosive mine	Class A explosive		Explosive A	None	173.56	Forbidden	Forbidden	1,2	5	Magazine stowage authorized. No other cargo may be stowed in the same hold with these items
	Explosive, new approval, and evaluation. See 173.86										
	Explosive pest control devices	Class C explosive		Explosive C	None	173.100	50 pounds	150 pounds	1,3	1,3	
	Explosive power device, Class B	Class B explosive		Explosive B	None	173.94	Forbidden	150 pounds	1,2	5	
	Explosive power device, Class C	Class C explosive		Explosive C	None	173.102	50 pounds	150 pounds	1,3	1,3	
	Explosive projectile	Class A explosive		Explosive A	None	173.58	Forbidden	Forbidden	1,2	5	Magazine stowage authorized. No other cargo may be stowed in the same hold with this material
	Explosive release device	Class C explosive		Explosive C	None	173.102	50 pounds	150 pounds	1,3	1,3	
	Explosive rivet	Class C explosive		Explosive C	None	173.100	50 pounds	150 pounds	1,2	1,2	
	Explosive, sample for laboratory examination				173.86		Forbidden	See 173.86			
	Explosive torpedo	Class A explosive		Explosive A	None	173.56	Forbidden	Forbidden	1,2	5	Magazine stowage authorized. No other cargo may be stowed in the same hold with this material
	Extract, liquid, flavoring	Flammable liquid	UN1197	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
E	Ferric ammonium citrate (*RQ-1000/454*)	ORM-E	NA9118	None	None	173.510	No limit	No limit	1,2	1,2	

E	Ferric ammonium oxalate (*RQ-1000/454*)	ORM-E	NA9119	None	None	173.510	No limit	No limit	1,2	1,2	
	Ferric arsenate, solid	Poison B	UN1606	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
	Ferric arsenite, solid	Poison B	UN1607	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
EA	Ferric chloride, solid, *anhydrous* (*RQ-1000/454*)	ORM-B	UN1773	None	173.505	173.510	25 pounds	100 pounds	1,2	1,2	
E	Ferric chloride solution (*RQ-1000/454*)	Corrosive material	UN2582	Corrosive	173.244	173.245	1 quart	10 quarts	1,2	1,2	
E	Ferric fluoride (*RQ-100/45.4*)	ORM-E	NA9120	None	None	173.510	No limit	No limit	1,2	1,2	
E	Ferric nitrate (*RQ-1000/454*)	Oxidizer	UN1466	Oxidizer	173.153	173.182	25 pounds	100 pounds	1,2	1,2	
E	Ferric sulfate (*RQ-1000/454*)	ORM-E	NA9121	None	None	173.510	No limit	No limit	1,2	1,2	
W	Ferrochrome, exothermic	ORM-C		None	173.505	173.965			1	1	
W	Ferromanganese, exothermic. *See* Ferrochrome, exothermic										
W	Ferrophosphorus	ORM-A		None	173.505	173.635			1,2	1,2	Keep dry. Stow away from living quarters
AW	Ferrosilicon, *containing 30% or more but not more than 70% silicon*	ORM-A	UN1408	None	173.505	173.645	Forbidden	25 pounds	1,2	1,2	Keep dry. Stow away from living quarters. Segregation same as for flammable solids labeled Dangerous When Wet
E	Ferrous ammonium sulfate (*RQ-1000/454*)	ORM-E	NA9122	None	None	173.510	No limit	No limit	1,2	1,2	
	Ferrous arsenate, solid	Poison B	UN1608	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
EA	Ferrous chloride, solid (*RQ-100/45.4*)	ORM-B	NA1759	None	173.505	173.510	No limit	No limit	1,2	1,2	
E	Ferrous chloride, solution (*RQ-100/45.4*)	Corrosive material	NA1760	Corrosive	173.244	173.245	1 quart	5 gallons	1,2	1,2	
E	Ferrous sulfate (*RQ-1000/454*)	ORM-E	NA9125	None	None	173.510	No limit	No limit	1,2	1,2	
	Fertilizer ammoniating solution *containing free ammonia (more than 25.3 p.s.i.g.)*	Nonflammable gas	UN1043	Nonflammable gas	173.306	173.304 173.314	Forbidden	300 pounds	1,2	4	
W	Fibers (*jute, hemp, flax, sisal, coir, kapok, and similar vegetable fibers*)	ORM-C	NA1372	None	173.505	173.965			1,2	1,2	Stow away from animal or vegetable oils. Segregation same as for flammable solids
	Film (*nitrocellulose*)	Flammable solid	NA1324	Flammable solid	None	173.177	50 pounds	200 pounds	1,3	1,3	Stow away from other flammable cargo or substances
	Firecracker. See Fireworks, common *or* special										
	Firecracker salute. See Fireworks, common *or* special										
	Fire extinguisher	Nonflammable gas	UN1044	Nonflammable gas	173.306		150 pounds	300 pounds	1,2	1,2	
	Fire extinguisher charge containing not more than 50 grains of propellant explosive per unit. Not subject to requirements of this subchapter.										
	Fire extinguisher charge containing sulfuric acid	Corrosive material	UN1774	Corrosive	173.261		1 quart	1 gallon	1,2	1,2	
	Fireworks, common	Class C explosive		Explosive C	None	173.100 173.108	50 pounds	200 pounds	1,3	1,3	Passenger vessels in metal lockers only
	Fireworks, exhibition display piece. See Fireworks, special										
	Fireworks, special	Class B explosive		Explosive B	None	173.88 173.91	Forbidden	200 pounds	3	3	Passenger vessels in metal lockers only. Toy torpedoes must not be packed with other special fireworks
W	Fish meal *or* fish scrap containing 6% to 12% water	ORM-C	NA2216	None	173.505	173.995			1,2	1,2	Segregation same as for flammable solids. Separate from flammable gases or liquids, oxidizing materials, or organic peroxides. *Use double strip stowage* for cargo 6-12 percent moisture containing not more than 12 percent fat. *Use single strip stowage* for cargo 6-12 percent moisture containing 12-15 percent fat.

Hazardous Materials Table—Continued

(1)	(2)	(3)	(3A)	(4)	(5) Packaging		(6) Maximum net quantity in one package		(7) Water shipments		
+ E A W	Hazardous materials descriptions and proper shipping names	Hazard class	Identification number	Label(s) required (if not excepted)	(a) Exceptions	(b) Specific requirements	(a) Passenger carrying aircraft or railcar	(b) Cargo aircraft only	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Fish meal *or* fish scrap containing less than 6% or more than 12% water	Flammable solid	NA1374	Flammable solid	None	173.171	Forbidden	Forbidden	1,2	1,2	Separate from flammable gases or liquids, oxidizing materials, or organic peroxides
	Fissile radioactive material. *See* Radioactive material, fissile										
	Flame retardant compound liquid	Corrosive material	NA1760	Corrosive	173.244	173.291	1 quart	10 gallons	1,2	1,2	
+	Flammable gas n.o.s. *See* Compressed gas, n.o.s.										
	Flammable liquid, corrosive, n.o.s.	Flammable liquid	UN2924	Flammable liquid and Corrosive	None	173.119	1 quart	1 quart	1,2	1	
	Flammable liquid, n.o.s.	Flammable liquid	UN1993	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Flammable liquid, poisonous, n.o.s.	Flammable liquid	UN1992	Flammable liquid and Poison	None	173.119	1 quart	10 gallons	1,2	1	
	Flammable solid, corrosive, n.o.s.	Flammable solid	UN2925	Flammable solid and Corrosive	173.153	173.154	25 pounds	25 pounds	1	4	
	Flammable solid, n.o.s.	Flammable solid	UN1325	Flammable solid	173.153	173.154	25 pounds	25 pounds	1,2	1,2	
	Flammable solid, poisonous, n.o.s.	Flammable solid	UN2926	Flammable solid and Poison	173.153	173.154	25 pounds	25 pounds	1,2	1	
	Flare. See Fireworks, common										
	Flare, airplane. See Fireworks, special										
	Flash cartridge. See Fireworks, special *or* Low explosives										
	Flash cracker. See Fireworks, common *or* special										
	Flash powder. See Fireworks, special *or* Low explosives										
	Flexible linear shaped charge, metal clad	Class C explosive		Explosive C	None	173.106	50 pounds	300 pounds	1,3	1,3	
	Flowers of sulfur. *See* Sulfur										
	Flue dust, poisonous	Poison B	NA2811	Poison	173.364	173.368	50 pounds	200 pounds	1,2	1,2	
	Fluoboric acid	Corrosive material	UN1775	Corrosive	173.244	173.283	1 quart	1 gallon	1,2	1,2	
E	Fluoric acid. *See* Hydrofluoric acid										
	Fluorine	Nonflammable gas	UN1045	Poison and Oxidizer	None	173.302	Forbidden	Forbidden	1	5	Stow in well ventilated space away from organic materials

	Fluorophosphoric acid, anhydrous. *See* Monofluorophosphoric acid, anhydrous										
	Fluorosilicic acid. *See* Hydrofluorosilicic acid										
	Fluorosulfonic acid *or* Fluosulfonic acid	Corrosive material	UN1777	Corrosive	None	173.274	Forbidden	1 gallon	1	5	Keep dry
	Fluosilicic acid	Corrosive material	UN1778	Corrosive	None	173.265	1 quart	1 gallon	1,2	1,2	
	Forbidden explosives. See 173.51	Forbidden									
	Forbidden materials. See 173.21	Forbidden									
EAW	Formaldehyde solution (*flash point more than 141 deg F.; in containers of 110 gallons or less*) (*RQ-1000/454*)	ORM-A	UN2209	None	173.505	173.510	10 gallons	55 gallons	1,2	4	
E	Formaldehyde solution (*flash point not more than 141 deg F.; in containers over 110 gallons*) (*RQ-1000/454*)	Combustible liquid	UN1198	None	173.118a	None	10 gallons	55 gallons	1,2	1,2	
EAW	Formaldehyde solution (*flash point not more than 141 deg F.; in containers of 110 gallons or less*) (*RQ-1000/454*)	ORM-A	UN1198	None	173.505	173.510	10 gallons	55 gallons	1,2	4	
E	Formaldehyde solution (*flash point more than 141 deg F.; in containers over 110 gallons*) (*RQ-1000/454*)	Combustible liquid	UN2209	None	173.118a	None	10 gallons	55 gallons	1,2	1,2	
	Formalin. *See* Formaldehyde solution										
E	Formic acid (*RQ-5000/2270*)	Corrosive material	UN1779	Corrosive	173.244	173.289	1 quart	5 gallons	1,2	1,2	Glass carboys in hampers not permitted under deck
E	Formic acid solution (*RQ-5000/2270*)	Corrosive material	UN1779	Corrosive	173.244	173.289	1 quart	5 gallons	1,2	1,2	
	Fuel, aviation, turbine engine	Flammable liquid	UN1863	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Fuel, aviation, turbine engine	Combustible liquid	UN1863	None	173.118a	None	No limit	No limit	1,2	1,2	
	Fuel oil	Combustible liquid	NA1993	None	173.118a	None	No limit	No limit	1,2	1,2	
	Fuel oil, diesel. *See* Fuel oil										
	Fuel oil, No. 1, 2, 4, 5 *or* 6	Combustible liquid	NA1993	None	173.118a	None	No limit	No limit	1,2	1,2	
	Fulminate of mercury (dry)	Forbidden									
	Fulminate of mercury, wet. See Initiating explosive										
	Fulminating gold	Forbidden									
	Fulminating mercury	Forbidden									
	Fulminating platinum	Forbidden									
	Fulminating silver	Forbidden									
	Fulminic acid	Forbidden									
E	Fumaric acid (*RQ-5000/2270*)	ORM-E	NA9126	None	None	173.510	No limit	No limit	1,2	1,2	
	Fumaryl chloride	Corrosive material	UN1780	Corrosive	173.244	173.245	1 quart	1 quart	1	1	Glass carboys not permitted
	Fumigant. See 173.152(a) Note 1										
	Furan	Flammable liquid	UN2389	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
E	Furfural (*RQ-1000/454*)	Combustible liquid	UN1199	None	173.118a	None	No limit	No limit	1,2	1	
	Fusee (*railway or highway*)	Flammable solid	NA1325	Flammable solid	None	173.154a	50 pounds	200 pounds	1,3	1,3	
	Fuse igniter	Class C explosive		Explosive C	None	173.106	50 pounds	150 pounds	1,3	1,3	

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Hazardous Materials Table—Continued

(1)	(2)	(3)	(3A)	(4)	(5)		(6)		(7)		
					Packaging		Maximum net quantity in one package		Water shipments		
+ E A W	Hazardous materials descriptions and proper shipping names	Hazard class	Identification number	Label(s) required (if not excepted)	(a) Exceptions	(b) Specific requirements	(a) Passenger carrying aircraft or railcar	(b) Cargo aircraft only	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Fuse, instantaneous	Class C explosive		Explosive C	173.100		50 pounds	150 pounds	1,2	1,2	
	Fuse lighter	Class C explosive		Explosive C	None	173.108	50 pounds	150 pounds	1,3	1,3	
	Fusel oil	Combustible liquid	UN1201	None	173.118a	None	No limit	No limit	1,2	1,2	
	Fuse, mild detonating, metal clad	Class C explosive		Explosive C	None	173.104	50 pounds	300 pounds	1,2	1,2	
	Fuse, safety	Class C explosive		Explosive C	173.100	173.100	50 pounds	300 pounds	1,2	1,2	
	Fuze, combination	Class C explosive		Explosive C	None	173.105	50 pounds	150 pounds	1,3	1,3	
	Fuze, detonating	Class A explosive		Explosive A	None	173.69	Forbidden	Forbidden	6	5	
	Fuze, detonating, Class C explosive	Class C explosive		Explosive C	None	173.113	50 pounds	150 pounds	1,3	1,3	
	Fuze, detonating, radioactive	Class A explosive		Explosive A	None	173.69	Forbidden	Forbidden	6	5	
	Fuze, percussion	Class C explosive		Explosive C	None	173.105	50 pounds	150 pounds	1,3	1,3	
	Fuze, time	Class C explosive		Explosive C	None	173.105	50 pounds	150 pounds	1,3	1,3	
	Fuze, tracer	Class C explosive		Explosive C	None	173.105	50 pounds	150 pounds	1,3	1,3	
	Galactsan trinitrate	Forbidden									
	Gallium metal, liquid	ORM-B	UN2803	None	None	173.861	Forbidden	Forbidden	1	5	None
	Gallium metal, solid	ORM-B	UN2803	None	None	173.862	40 pounds	40 pounds	1,3	1	Shade from radiant heat
	Gas cylinder, empty. See Cylinder, empty										
	Gas drips, hydrocarbon	Combustible liquid	UN1864	None	173.118a	None	No limit	No limit	1,2	1,2	
	Gas drips, hydrocarbon	Flammable liquid	UN1864	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Gas identification set	Poison A	NA9035	Poison gas	None	173.331	Forbidden	Forbidden	1	5	
	Gas identification set	Irritating material	NA9035	Irritant	None	173.331	Forbidden	Forbidden	1	5	
	Gas mine. See Explosive mine										
	Gasohol *(gasoline mixed with ethyl alcohol). See* Gasoline										
	Gasoline *(including casing-head and natural)*	Flammable liquid	UN1203	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	4	
	Gelatine Dynamite. See High explosive										

	Germane	Poison A	UN2192	Poison gas and Flammable gas	None	173.328	Forbidden	Forbidden	1	5	Segregation same as for flammable gases
	Glycerol-1,3-dinitrate	Forbidden									
	Glycerol monogluconate trinitrate	Forbidden									
	Glycerol monolactate trinitrate	Forbidden									
	Grenade without bursting charge. *(With incendiary material)*	Class B explosive		Explosive B	None	173.91	Forbidden	Forbidden	3	3	Passenger vessels in metal lockers only
	Grenade without bursting charge. *(With smoke charge)* (Smoke grenade)	Class C explosive		Explosive C	None	173.108	50 pounds	150 pounds	1,3	1,3	
	Grenade without bursting charge. *(With Poison A gas charge)*	Poison A	NA2016	Poison gas	None	173.330	Forbidden	Forbidden			*See* correct shipping name of applicable Poison A material for stowage, special handling, and special segregation requirements
	Grenade without bursting charge. *(With Poison B charge)*	Poison B	NA2016	Poison	None	173.350	Forbidden	Forbidden			*See* correct shipping name of applicable Poison B material for stowage, special handling, and special segregation requirements
	Grenade, empty, primed	Class C explosive		None	None	173.107	50 pounds	150 pounds	1,3	1,3	
	Grenade, hand *or* rifle, explosive *(with or without gas, smoke, or incendiary material)*	Class A explosive		Explosive A	None	173.56	Forbidden	Forbidden	1,2	5	No other cargo may be stowed in the same hold with these items
	Grenade, tear gas	Irritating material	NA2017	Irritant	None	173.385	Forbidden	75 pounds	1,2	1	
	Guanidine nitrate	Oxidizer	UN1467	Oxidizer	173.153	173.182	25 pounds	100 pounds	1,2	1,2	Separate from nitro-compounds, chlorates, and acids
	Guanyl nitrosamino guanylidene hydrazine. See Initiating explosive										
	Guanyl nitrosamino guanylidene hydrazine (dry)	Forbidden									
	Guanyl nitrosamino guanyl tetrazene. See Initiating explosive										
	Guided missile, without warhead. See Rocket motor, Class A explosive *or* Rocket motor, Class B explosive										
	Guided missile with warhead. See Rocket ammunition with explosive, illuminating, gas, incendiary, *or* smoke projectile										
	Guncotton. See High explosive										
E	Guthion. *See* Azinphos methyl										
E	Guthion mixture, liquid. *See* Azinphos methyl mixture, liquid										
	Hafnium metal, dry *(See 173.214 Note 3)*	Flammable solid	UN2545	Flammable solid	None	173.214	Forbidden	75 pounds	1	5	
	Hafnium metal, wet	Flammable solid	UN1326	Flammable solid	None	173.214	Forbidden	150 pounds	1,2	5	
	Hand signal device	Class C explosive		Explosive C	None	173.108	50 pounds	200 pounds	1,2	1,2	
E	Hazardous substance, liquid *or* solid, n.o.s.	ORM-E	NA9188	None	None	173.1300	No limit	No limit	1,2	1,2	
	Hazardous waste, liquid *or* solid, n.o.s.	ORM-E	NA9189	None	None	173.1300	Forbidden	550 pounds	1,2	1,2	
	Hazardous waste, meeting the definition of a hazard class other than ORM-E. See 172.101(c)(10)										
	Heater for refrigerator car, liquid fuel type *(containing fuel)*	Flammable liquid	NA1993	Flammable liquid	173.146		Forbidden	Forbidden	1,2	1	

Hazardous Materials Table—Continued

(1)	(2)	(3)	(3A)	(4)	(5) Packaging		(6) Maximum net quantity in one package		(7) Water shipments		
+ E A W	Hazardous materials descriptions and proper shipping names	Hazard class	Identification number	Label(s) required (if not excepted)	(a) Exceptions	(b) Specific requirements	(a) Passenger carrying aircraft or railcar	(b) Cargo aircraft only	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Helium *or* Helium, compressed	Nonflammable gas	UN1046	Nonflammable gas	173.306	173.302 173.314	150 pounds	300 pounds	1,2	1,2	
	Helium-oxygen mixture	Nonflammable gas	NA1980	Nonflammable gas	173.306	173.302	150 pounds	300 pounds	1,2	1,2	
	Helium, refrigerated liquid (*cryogenic liquid*)	Nonflammable gas	UN1963	Nonflammable gas	173.320	173.316 173.318	100 pounds	1,100 pounds	1,3	1,3	
E	Heptachlor (*RQ-1/0.454*)	ORM-E	NA2761	None	None	173.510	No limit	No limit	1,2	1,2	If stowed under deck, must be stowed in a recoverable location
	Heptane	Flammable liquid	UN1206	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
E	Hexachlorocyclopentadiene (*RQ-1/0.454*)	Corrosive material	UN2646	Corrosive	173.244	173.245	1 quart	10 gallons	1,2	1,2	
W	Hexachloroethane	ORM-A	NA9037	None	173.505	173.650			1,2	1,2	
	Hexadecyltrichlorosilane	Corrosive material	UN1781	Corrosive	None	173.280	Forbidden	10 gallons	1	1	Keep dry
	Hexadiene	Flammable liquid	UN2458	Flammable liquid	None	173.119	Forbidden	10 gallons	1,2	5	
	Hexaethyl tetraphosphate and compressed gas mixture	Poison A	UN1612	Poison gas	None	173.334	Forbidden	Forbidden	1	5	Shade from radiant heat
	Hexaethyl tetraphosphate, liquid	Poison B	UN1611	Poison	None	173.358	Forbidden	1 quart	1	4	
	Hexaethyl tetraphosphate mixture, dry (*containing more than 2% hexaethyl tetraphosphate*)	Poison B	NA2783	Poison	None	173.377	Forbidden	200 pounds	1,2	5	
	Hexaethyl tetraphosphate mixture, dry (*containing not more than 2% hexaethyl tetraphosphate*)	Poison B	NA2783	Poison	173.377	173.377	50 pounds	200 pounds	1,2	4	
	Hexaethyl tetraphosphate mixture, liquid (*containing more than 25% hexaethyl tetraphosphate*)	Poison B	NA2783	Poison	None	173.359	Forbidden	1 quart	1,2	5	
	Hexaethyl tetraphosphate mixture, liquid (*containing not more than 25% hexaethyl tetraphophate*)	Poison B	UN2783	Poison	173.359	173.359	1 quart	1 quart	1,2	4	
	Hexafluorophosphoric acid	Corrosive material	UN1782	Corrosive	None	173.275	Forbidden	1 gallon	1,2	1,2	
	Hexafluoropropylene	Nonflammable gas	UN1858	Nonflammable gas	173.306	173.304 173.314 173.315	150 pounds	300 pounds	1	4	
	Hexafluoropropylene oxide	Nonflammable gas	NA1956	Nonflammable gas	173.306	173.304 173.314	150 pounds	300 pounds	1,2	1,2	
	Hexaldehyde	Flammable liquid	UN1207	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1,2	

3,3,6,6,9,9-Hexamethyl-1,2,4,5-tetraoxocyclononane, *technically pure.* See Organic peroxide, solid, n.o.s.		UN2165								
3,3,6,6,9,9-Hexamethyl-1,2,4,5-tetraoxocyclononane, *not more than 52% with inert solid.* See Organic peroxide, solid, n.o.s.		UN2166								
3,3,6,6,9,9-Hexamethyl-1,2,4,5-tetraoxocyclononane, *not more than 52% in solution.* See Organic peroxide, liquid or solution, n.o.s.		UN2167								
Hexamethylenediamine, solid	Corrosive material	UN2280	Corrosive	173.244	173.245b	25 pounds	100 pounds	1,2	1,2	
Hexamethylenediamine, solution	Corrosive material	UN1783	Corrosive	173.244	173.292	1 quart	10 gallons	1,2	1,2	
Hexamethyleneimine	Flammable liquid	UN2493	Flammable liquid and Corrosive	None	173.119	1 quart	1 gallon	1,2	1	
Hexamethylene triperoxide diamine (dry)	Forbidden									
Hexamethylol benzene hexanitrate	Forbidden									
Hexane	Flammable liquid	UN1208	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,3	4	
2,2',4,4',6,6'-Hexanitro-3,3'-dihydroxyazobenzene (dry)	Forbidden									
Hexanitroazoxy benzene	Forbidden									
2,2',3',4,4',6-Hexanitrodiphenylamine	Forbidden									
2,3',4,4',6,6'-Hexanitrodiphenylether	Forbidden									
N,N'-(hexanitrodiphenyl)ethylene dinitramine (dry)	Forbidden									
Hexanitrodiphenyl urea	Forbidden									
Hexanitroethane	Forbidden									
Hexanitrooxanilide	Forbidden									
Hexanoic acid	Corrosive material	NA1760	Corrosive	173.244	173.245	1 quart	10 gallons	1,2	1,2	
Hexyltrichlorosilane	Corrosive material	UN1784	Corrosive	None	173.280	Forbidden	10 gallons	1	1	Keep dry
High explosive	Class A explosive		Explosive A	173.65	173.61 to 173.87	Forbidden	Forbidden	6	5	
High explosive, liquid	Class A explosive		Explosive A	None	173.62	Forbidden	Forbidden	6	5	
Hydraulic accumulator. See Accumulator, pressurized										
Hydrazine, anhydrous	Flammable liquid	UN2029	Flammable liquid and Poison	None	173.276	Forbidden	5 pints	1	5	Segregation same as for corrosives
Hydrazine, aqueous solution	Corrosive material	UN2030	Corrosive	None	173.276	Forbidden	5 pints	1	5	
Hydrazine azide	Forbidden									
Hydrazine chlorate	Forbidden									
Hydrazine dicarbonic acid diazide	Forbidden									
Hydrazine perchlorate	Forbidden									
Hydrazine selenate	Forbidden									
Hydriodic acid	Corrosive material	UN1787	Corrosive	173.244	173.245	1 quart	1 gallon	1	1	Glass carboys not permitted on passenger vessel
Hydrobromic acid, *more than 49% strength*	Corrosive material	UN1788	Corrosive	None	173.262	Forbidden	Forbidden	1	1	Glass carboys not permitted on passenger vessel

Hazardous Materials Table—Continued

(1)	(2)	(3)	(3A)	(4)	(5) Packaging		(6) Maximum net quantity in one package		(7) Water shipments		
+ E A W	Hazardous materials descriptions and proper shipping names	Hazard class	Identification number	Label(s) required (if not excepted)	(a) Exceptions	(b) Specific requirements	(a) Passenger carrying aircraft or railcar	(b) Cargo aircraft only	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Hydrobromic acid, anhydrous. *See* Hydrogen bromide										
	Hydrobromic acid not more than 49% strength	Corrosive material	UN1788	Corrosive	173.244	173.262	1 quart	1 gallon	1	1	Glass carboys not permitted on passenger vessel
+	Hydrocarbon gas, liquefied	Flammable gas	UN1965	Flammable gas	173.306	173.304 173.314	Forbidden	300 pounds	1,2	1	
+	Hydrocarbon gas, nonliquefied	Flammable gas	UN1964	Flammable gas	173.306	173.302	Forbidden	300 pounds	1,2	1	
E	Hydrochloric acid (*RQ-5000/2270*)	Corrosive material	UN1789	Corrosive	173.244	173.263	1 quart	1 gallon	1	1	Glass carboys not permitted on passenger vessel
E	Hydrochloric acid, anhydrous. *See* Hydrogen chloride										
E	Hydrochloric acid mixture (*RQ-5000/2270*)	Corrosive material	NA1789	Corrosive	173.244	173.263	1 quart	1 gallon	1	1	Glass carboys not permitted on passenger vessel
E	Hydrochloric acid solution, inhibited (*RQ-5000/2270*)	Corrosive material	UN1789	Corrosive	173.244	173.263	1 quart	1 gallon	1	1	Glass carboys not permitted on passenger vessel
E	Hydrocyanic acid (*prussic*) solution (*5% or more hydrocyanic acid*) (*RQ-10/4.54*)	Poison A	UN1613	Poison gas andFlammable gas	None	173.332	Forbidden	Forbidden	1	5	Shade from radiant heat. Aqueous solutions containing more than 20 percent hydrogen cyanide are not permitted in transportation by water. Segregation same as for flammable gases.
E	Hydrocyanic acid, liquefied (*RQ-10/4.54*)	Poison A	NA1051	Poison gas andFlammable gas	None	173.332	Forbidden	Forbidden	1	5	Segregation same as for flammable gases.
	Hydrocyanic acid (prussic), unstabilized	Forbidden									
+E	Hydrocyanic acid solution, less than 5% hydrocyanic acid (*RQ-10/4.54*)	Poison B	UN1613	Poison	None	173.351	Forbidden	25 pounds	1	5	Shade from radiant heat
E	Hydrofluoric acid, anhydrous. *See* Hydrogen fluoride										
E	Hydrofluoric acid solution (*RQ-5000/2270*)	Corrosive material	UN1790	Corrosive	173.244	173.264	1 quart	1 gallon	1	4	
E	Hydrofluoric and sulfuric acid mixture (*RQ-5000/2270*)	Corrosive material	UN1786	Corrosive	None	173.290	Forbidden	1 gallon	1	5	
	Hydrofluoroboric acid. *See* Fluoboric acid										
	Hydrofluorosilicic acid *or* Hydrofluosilicic acid	Corrosive material	NA1778	Corrosive	None	173.265	1 quart	1 gallon	1,2	1,2	
+	Hydrogen *or* Hydrogen, compressed	Flammable gas	UN1049	Flammable gas	173.306	173.302 173.314	Forbidden	300 pounds	1,2	4	Stow away from living quarters
+	Hydrogen, refrigerated liquid (*cryogenic liquid*)	Flammable gas	UN1966	Flammable gas	None	173.316 173.318 173.319	Forbidden	Forbidden	5	5	

	Hydrogen bromide	Nonflammable gas	UN1048	Nonflammable gas	173.306	173.304	Forbidden	300 pounds	1	4	
E	Hydrogen chloride (*RQ-5000/2270*) *or* Hydrogen chloride, anhydrous (RQ-5000/2270)	Nonflammable gas	UN1050	Nonflammable gas	173.306	173.304	Forbidden	300 pounds	1	4	Stow away from living quarters
E	Hydrogen chloride, refrigerated liquid (*RQ-5000/2270*)	Nonflammable gas	UN2186	Nonflammable gas	None	173.314 173.315	Forbidden	300 pounds	1,2	4	Stow in well ventilated space
E	Hydrogen fluoride (*RQ-5000/2270*)	Corrosive material	UN1052	Corrosive	None	173.264	Forbidden	110 pounds	1	5	Segregation same as for nonflammable gases
	Hydrogen iodide solution. *See* Hydriodic acid										
	Hydrogen peroxide solution (*40% to 52% peroxide*)	Oxidizer	UN2014	Oxidizer	173.244	173.266	Forbidden	Forbidden	1	4	Shade from radiant heat. Separate from permanganates. Keep away from powdered metals
	Hydrogen peroxide solution (*8% to 40% peroxide*)	Oxidizer	UN2014	Oxidizer	173.244	173.266	1 quart	1 gallon	1,2	1	Shade from radiant heat. Separate from permanganates. Keep away from powdered metals
	Hydrogen peroxide solution (*over 52% peroxide*)	Oxidizer	UN2015	Oxidizer and Corrosive	None	173.266	Forbidden	Forbidden	1	5	Shade from radiant heat. Separate from permanganates. Keep away from powdered metals. Concentrations greater than 60% hydrogen peroxide not permitted on any vessel except under conditions approved by the Department
•	Hydrogen selenide	Flammable gas	UN2202	Flammable gas and Poison	None	173.328	Forbidden	Forbidden	1	5	
E	Hydrogen sulfate. *See* Sulfuric acid										
•E	Hydrogen sulfide (*RQ-100/45.4*)	Flammable gas	UN1053	Flammable gas and Poison	None	173.304 173.314	Forbidden	300 pounds	1	5	
	Hydrosilicofluoric acid. *See* Hydrofluorosilicic acid										
	Hydroxyl amine iodide	Forbidden									
E	Hypochlorite solution *containing more than 7% available chlorine by weight (RQ-100/45.4)*	Corrosive material	UN1791	Corrosive	173.244	173.277	1 quart	4 gallons	1,2	1	Glass carboys in hampers not permitted under deck
EA	Hypochlorite solution containing not more than 7% available chlorine *by weight (RQ-100/45.4)*	ORM-B	NA1791	None	173.505	173.510	No limit	No limit			
	Hyponitrous acid	Forbidden									
	Igniter	Class C explosive		Explosive C	None	173.106	50 pounds	150 pounds	1,3	1,3	
	Igniter cord	Class C explosive		Explosive C	None	173.100	50 pounds	150 pounds	1,3	1,3	
	Igniter fuse, metal clad	Class C explosive		Explosive C	None	173.106	50 pounds	150 pounds	1,3	1,3	
	Igniter, jet thrust (jato)	Class A explosive		Explosive A	None	173.79	Forbidden	Forbidden	6	5	
	Igniter, jet thrust (jato)	Class B explosive		Explosive B	None	173.92	Forbidden	550 pounds	1,3	5	
	Igniter, rocket motor	Class A explosive		Explosive A	None	173.79	Forbidden	Forbidden	6	5	
	Igniter, rocket motor	Class B explosive		Explosive B	None	173.92	Forbidden	550 pounds	1,3	5	
	Illuminating projectile. See Fireworks, special										

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Hazardous Materials Table—Continued

(1)	(2)	(3)	(3A)	(4)	(5) Packaging		(6) Maximum net quantity in one package		(7) Water shipments		
+ E A W	Hazardous materials descriptions and proper shipping names	Hazard class	Identification number	Label(s) required (if not excepted)	(a) Exceptions	(b) Specific requirements	(a) Passenger carrying aircraft or railcar	(b) Cargo aircraft only	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Iminobispropylamine	Corrosive material	UN2269	Corrosive	173.244	173.245	1 quart	10 gallons	1,2	1,2	
	Infectious substance, human, n.o.s. *See* Etiologic Agent n.o.s.										
	Initiating explosive (*diazodinitrophenol*)	Class A explosive		Explosive A	None	173.70	Forbidden	Forbidden	6	5	
	Initiating explosive (*fulminate of mercury*)	Class A explosive		Explosive A	None	173.71	Forbidden	Forbidden	6	5	
	Initiating explosive (*guanyl nitrosamino guanylidene hydrazine*)	Class A explosive		Explosive A	None	173.72	Forbidden	Forbidden	6	5	
	Initiating explosive (*lead azide, dextrinated type only*)	Class A explosive		Explosive A	None	173.73	Forbidden	Forbidden	6	5	
	Initiating explosive (*lead mononitroresorcinate*)	Class A explosive		Explosive A	None	173.70	Forbidden	Forbidden	6	5	
	Initiating explosive *barium styphnate, monohydrate, lead styphnate (lead trinitroresorcinate)*	Class A explosive		Explosive A	None	173.74	Forbidden	Forbidden	6	5	
	Initiating explosive (*nitro mannite*)	Class A explosive		Explosive A	None	173.75	Forbidden	Forbidden	6	5	
	Initiating explosive (*nitrosoguanidine*)	Class A explosive		Explosive A	None	173.76	Forbidden	Forbidden	6	5	
	Initiating explosive (*pentaerythrite tetranitrate*)	Class A explosive		Explosive A	None	173.77	Forbidden	Forbidden	6	5	
	Initiating explosive (*tetrazene (guanyl nitrosamine guanyl tetrazene)*)	Class A explosive		Explosive A	None	173.78	Forbidden	Forbidden	6	5	
	Initiating explosives (dry)	Forbidden									
	Ink	Combustible liquid	UN2867	None	173.118a	None	No limit	No limit	1,2	1,2	
	Ink	Flammable liquid	UN1210	Flammable liquid	173.118	173.144	1 quart	10 gallons	1,2	1	
	Inositol hexanitrate (dry)	Forbidden									
	Insecticide, dry, n.o.s.	Poison B	NA2588	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
	Insecticide, liquefied gas (*containing no Poison A or B material*)	Nonflammable gas	NA1968	Nonflammable gas	173.306	173.304	150 pounds	300 pounds	1,3	1,3	
	Insecticide, liquefied gas, containing Poison A material *or* Poison B material	Poison A	NA1967	Poison gas	None	173.329 173.334	Forbidden	Forbidden	1	5	Shade from radiant heat
	Insecticide, liquid, n.o.s.	Combustible liquid	NA1993	None	173.118a	None	No limit	No limit	1,2	1,2	
	Insecticide, liquid, n.o.s.	Flammable liquid	NA1993	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Insecticide, liquid, n.o.s.	Poison B	NA2902	Poison	173.345	173.346	1 quart	55 gallons	1,2	1,2	

	Inulin trinitrate (dry)	Forbidden									
	Iodine azide (dry)	Forbidden									
	Iodine monochloride	Corrosive material	UN1792	Corrosive	None	173.293	Forbidden	1 quart	1	5	Keep dry
	Iodine pentafluoride	Oxidizer	UN2495	Oxidizer and Poison	None	173.246	Forbidden	100 pounds	1	1	Keep dry
	Iodoxy compounds (dry)	Forbidden									
	Iridium nitratopentamine iridium nitrate	Forbidden									
E	Iron chloride, solid *See* Ferric chloride, solid										
	Iron mass *or* sponge, *not properly oxidized*	Flammable solid	NA1383	Flammable solid	None	173.174	Forbidden	Forbidden	1,2	5	Separate from flammable gases or liquids, oxidizing materials, or organic peroxides
	Iron mass *or* sponge, spent	Flammable solid	UN1376	Flammable solid	None	173.174	Forbidden	Forbidden	1,2	5	Separate from flammable gases or liquids, oxidizing materials, or organic peroxides
	Iron oxide, spent *See* Iron mass *or* sponge, spent										
E	Iron sesquichloride, solid *See* Ferric chloride										
	Irritating agent, n.o.s.	Irritating material	NA1693	Irritant	None	173.382	Forbidden	75 pounds	1	1	Stow away from living quarters
	Isobutane *or* Liquefied petroleum gas *See* Liquefied petroleum gas										
E	Isobutyl acetate(*RQ-5000/2270*)	Flammable liquid	UN1213	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
E	Isobutylamine(*RQ-1000/454*)	Flammable liquid	UN1214	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Isobutylene *or* Liquefied petroleum gas *See* Liquefied petroleum gas										
E	Isobutyric acid (*RQ-5000/2270*)	Corrosive material	UN2529	Corrosive	173.244	173.245	1 quart	10 gallons	1,2	1,2	
	Isobutyric anhydride	Corrosive material	UN2530	Corrosive	173.244	173.245	1 quart	10 gallons	1,2	1,2	
	Isononanyl peroxide, *technically pure or* Isononanyl peroxide, *in solution. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2128								
	Isooctane	Flammable liquid	UN1262	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Isooctene	Flammable liquid	UN1216	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,3	4	
	Isopentane	Flammable liquid	UN1265	Flammable liquid	173.118	173.119	Forbidden	10 gallons	1,3	4	
	Isopentanoic acid	Corrosive material	NA1760	Corrosive	173.244	173.245	1 quart	10 gallons	1,2	1,2	
E	Isoprene (*RQ-1000/454*)	Flammable liquid	UN1218	Flammable liquid	173.118	173.119	Forbidden	10 gallons	1,3	4	
	Isopropanol	Flammable liquid	UN1219	Flammable liquid	173.118	173.125	1 quart	10 gallons	1,2	1	
E	Isopropanolamine dodecylbenzenesulfonate (*RQ-1000/454*)	ORM-E	NA9127	None	None	173.510	No limit	No limit	1,2	1,2	
	Isopropyl acetate	Flammable liquid	UN1220	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Isopropyl acid phosphate, solid	Corrosive material	UN1793	Corrosive	173.244	173.245b	25 pounds	100 pounds	1,2	1,2	
	Isopropyl alcohol *See* Isopropanol										
	Isopropylamine	Flammable liquid	UN1221	Flammable liquid	None	173.119	Forbidden	10 gallons	1,3	5	

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Hazardous Materials Table—Continued

(1)	(2)	(3)	(3A)	(4)	(5) Packaging		(6) Maximum net quantity in one package		(7) Water shipments		
• E A W	Hazardous materials descriptions and proper shipping names	Hazard class	Identification number	Label(s) required (if not excepted)	(a) Exceptions	(b) Specific requirements	(a) Passenger carrying aircraft or railcar	(b) Cargo aircraft only	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Isopropyl mercaptan	Flammable liquid	UN2703	Flammable liquid	None	173.141	Forbidden	10 gallons	1.3	5	
	Isopropyl nitrate	Flammable liquid	UN1222	Flammable liquid	173.118	173.119	1 quart	10 gallons	1.2	1	
	Isopropyl percarbonate, stabilized	Organic peroxide	NA2134	Organic peroxide	None	173.282	Forbidden	Forbidden	5	5	
	Isopropyl percarbonate, unstabilized	Organic peroxide	NA2133	Organic peroxide	None	173.218	Forbidden	Forbidden	5	5	
	Isopropyl peroxydicarbonate, *technically pure. See* Isopropyl percarbonate, unstabilized		UN2133								
	Isopropyl peroxydicarbonate, *not more than 52% in solution. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2134								
	Isopropyl phosphoric acid, solid. *See* Isopropyl acid phosphate, solid										
	Isothiocyanic acid (polymerization hazard)	Forbidden									
	Jet thrust igniter. *See* Igniter, jet thrust										
	Jet thrust unit (*jato*)	Class A explosive		Explosive A	None	173.79	Forbidden	Forbidden	6	5	
	Jet thrust unit (*jato*)	Class B explosive		Explosive B	None	173.92	Forbidden	550 pounds	1.3	5	
E	Kelthane (*RQ-5000/2270*)	ORM-E	NA2761	None	None	173.510	No limit	No limit	1.2	1.2	
E	Kepone (*RQ-1/0.454*)	ORM-E	NA2761	None	None	173.510	No limit	No limit	1.2	1.2	
	Kerosene	Combustible liquid	UN1223	None	173.118a	None	No limit	No limit	1.2	1.2	
	Lacquer base *or* Lacquer chips, plastic (*wet with alcohol or solvent*)	Flammable liquid	UN1263	Flammable liquid	173.118	173.127	1 quart	25 pounds	1.2	1	
	Lacquer base, *or* Lacquer chips, dry	Flammable solid	NA2557	Flammable solid	173.153	173.175	25 pounds	100 pounds	1	1	
	Lauroyl peroxide	Organic peroxide	UN2124	Organic peroxide	173.153	173.157 173.158	2 pounds	25 pounds	1.2	1	
	Lauroyl peroxide, *not more than 42%, stable dispersion, in water. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2893								
	Lauroyl peroxide, *technically pure. See* Lauroyl peroxide		UN2124								
E	Lead acetate (*RQ-5000/2270*)	ORM-E	UN1616	None	None	173.510	No limit	No limit	1.2	1.2	
E	Lead arsenate, solid (*RQ-5000/2270*)	Poison B	UN1617	Poison	173.364	173.367	50 pounds	200 pounds	1.2	1.2	
	Lead arsenite, solid	Poison B	UN1618	Poison	173.364	173.365	50 pounds	200 pounds	1.2	1.2	
	Lead azide. See Initiating explosive										

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	Lead azide (dry)	Forbidden									
EA	Lead chloride (*RQ-5000/2270*)	ORM-B	NA2291	None	173.505	173.800	25 pounds	100 pounds	1.2	1.2	
	Lead cyanide	Poison B	UN1620	Poison	173.370		25 pounds	No limit	1.2	1.2	Stow away from acids
W	Lead dross (*containing 3% or more free acid*)	ORM-C	NA1794	None	173.505	173.1010			1.2	1.2	Segregation same as for corrosive materials
EA	Lead fluoborate (*RQ-5000/2270*)	ORM-B	NA2291	None	173.505	173.510	25 pounds	100 pounds	1.2	1.2	
EA	Lead fluoride (*RQ-1000/454*)	ORM-B	NA2811	None	173.505	173.510	25 pounds	100 pounds	1.2	1.2	
E	Lead iodide (*RQ-5000/2270*)	ORM-E	NA2811	None	None	173.510	No limit	No limit	1.2	1.2	
	Lead mononitroresorcinate. See Initiating explosive										
	Lead mononitroresorcinate (dry)	Forbidden									
E	Lead nitrate (*RQ-5000/2270*)	Oxidizer	UN1469	Oxidizer	173.153	173.182	25 pounds	100 pounds	1.2	1.2	Stow away from foodstuffs
	Lead peroxide	Oxidizer	UN1872	Oxidizer	173.153	173.154	25 pounds	100 pounds	1.2	1.2	Stow away from foodstuffs
	Lead picrate (dry)	Forbidden									
W	Lead scrap. *See* Lead dross										
E	Lead stearate (*RQ-5000/2270*)	ORM-E	NA2811	None	None	173.510	No limit	No limit	1.2	1.2	
	Lead styphnate (dry)	Forbidden									
	Lead styphnate (lead trinitroresorcinate). See Initiating explosive										
E	Lead sulfate (RQ-5000/2270)	ORM-E	NA2291	None	None	173.510	No limit	No limit	1.2	1.2	
E	Lead sulfate, solid (*containing more than 3% free acid*) (*RQ-5000/2270*)	Corrosive material	UN1794	Corrosive	173.244	173.245b	25 pounds	100 pounds	1.2	1.2	
E	Lead sulfide (*RQ-5000/2270*)	ORM-E	NA2291	None	None	173.510	No limit	No limit	1.2	1.2	
E	Lead thiocyanate (*RQ-5000/2270*)	ORM-E	NA2291	None	None	173.510	No limit	No limit	1.2	1.2	
	Life rafts, inflatable	ORM-C		None	None	173.906	1 per inaccessible cargo compartment	No limit	1.2	1.2	
	Lime-nitrogen. See Calcium cyanamide, not hydrated										
	Lime, unslaked. *See* Calcium oxide										
EA	Lindane (*RQ-1/454*)	ORM-A	NA2761	None	173.505	173.510	No limit	No limit	1.2	1.2	
*	Liquefied hydrocarbon gas. *See* Hydrocarbon gas, liquefied										
	Liquefied nonflammable gas (*charged with nitrogen, carbon dioxide, or air*)	Nonflammable gas	NA1058	Nonflammable gas	173.306	173.304	300 pounds	300 pounds	1.2	1.2	
*	Liquefied petroleum gas	Flammable gas	UN1075	Flammable gas	173.306	173.304 173.314 173.315	Forbidden	300 pounds	1.2	1	
	Liquid other than one classed as flammable, corrosive, poison or irritant, charged with nitrogen, carbon dioxide, or air. See Compressed gas n.o.s.										
	Lithium acetylide-ethylene diamine complex	Flammable solid	NA2813	Flammable solid and Dangerous when wet	None	173.206	Forbidden	25 pounds	1.2	5	Segregation same as for flammable solid labeled Dangerous When Wet
	Lithium aluminum hydride	Flammable solid	UN1410	Flammable solid and Dangerous when wet	None	173.206	Forbidden	25 pounds	1.2	5	Segregation same as for flammable solid labeled Dangerous When Wet
	Lithium aluminum hydride, ethereal	Flammable liquid	UN1411	Flammable liquid	None	173.137	Forbidden	1 quart	1	5	Segregation same as for flammable solids labeled Dangerous When Wet
	Lithium amide, powdered	Flammable solid	UN1412	Flammable solid	173.153	173.169	25 pounds	100 pounds	1.2	4	Segregation same as for flammable solids labeled Dangerous When Wet
	Lithium batteries, for disposal	ORM-C		None	None	173.1015	Forbidden	Forbidden			

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Hazardous Materials Table—Continued

(1)	(2)	(3)	(3A)	(4)	(5) Packaging		(6) Maximum net quantity in one package		(7) Water shipments		
• E A W	Hazardous materials descriptions and proper shipping names	Hazard class	Identification number	Labels required (if not excepted)	(a) Exceptions	(b) Specific requirements	(a) Passenger carrying aircraft or railcar	(b) Cargo aircraft only	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Lithium battery. See 173.206(f)										
	Lithium borohydride	Flammable solid	UN1413	Flammable solid and Dangerous when wet	None	173.206	Forbidden	25 pounds	1,2	5	Segregation same as for flammable solids labeled Dangerous When Wet
E	Lithium chromate (*RQ-1000/454*)	ORM-E	NA9134	None	None	173.510	No limit	No limit	1,2	1,2	
	Lithium ferrosilicon	Flammable solid	UN2830	Flammable solid and Dangerous when wet	None	173.206	Forbidden	25 pounds	1,2	5	Segregation same as for flammable solids labeled Dangerous When Wet
	Lithium hydride	Flammable solid	UN1414	Flammable solid and Dangerous when wet	None	173.206	Forbidden	25 pounds	1,2	5	Segregation same as for flammable solids labeled Dangerous When Wet
	Lithium hydride in fused solid form	Flammable solid	UN2805	Flammable solid and Dangerous when wet	None	173.206	Forbidden	100 pounds	1,2	5	Segregation same as for flammable solids labeled Dangerous When Wet
	Lithium hypochlorite compound, dry (*containing more than 39% available chlorine*)	Oxidizer	UN1471	Oxidizer	173.153	173.217	50 pounds	100 pounds	1,2	1,2	
	Lithium metal	Flammable solid	UN1415	Flammable solid and Dangerous when wet	None	173.206	Forbidden	25 pounds	1,2	5	Segregation same as for flammable solids labeled Dangerous When Wet
	Lithium metal, in cartridges	Flammable solid	UN1415	Flammable solid and Dangerous when wet	173.206	173.206	1 pound	25 pounds	1,2	4	Segregation same as for flammable solids labeled Dangerous When Wet
	Lithium nitride	Flammable solid	UN2806	Flammable solid and Dangerous when wet	None	173.206	Forbidden	25 pounds	1,2	5	Segregation same as for flammable solids labeled Dangerous When Wet
	Lithium peroxide	Oxidizer	UN1472	Oxidizer	173.153	173.154	25 pounds	100 pounds	1,2	1,2	Keep dry
	Lithium silicon	Flammable solid	UN1417	Flammable solid and Dangerous when wet	None	174.206	Forbidden	25 pounds	1,2	1,2	Segregation same as for flammable solids labeled Dangerous When Wet
	London purple, solid	Poison B	UN1621	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
	Low blasting explosive. See Low explosive										

	Low explosive	Class A explosive		Explosive A	None	173.60	Forbidden	Forbidden	6	5	
	Lye. See Sodium hydroxide, solid										
	Magnesium aluminum phosphide	Flammable solid	UN1419	Flammable solid and Dangerous when wet	None	173.206	Forbidden	25 pounds	1.2	1.2	Segregation same as for flammable solids labeled Dangerous When Wet
•	Magnesium arsenate, solid	Poison B	UN1622	Poison	173.364	173.367	50 pounds	200 pounds	1.2	1.2	
	Magnesium dross, wet or hot. See 173.173	Forbidden									
	Magnesium granules coated, *particle size not less than 149 microns*	Flammable solid	UN2950	Flammable solid and Dangerous when wet	173.153	173.178	25	100	1.2	1.2	Segregation same as for flammable solids labeled Dangerous When Wet
	Magnesium metal (*powder, pellets, turnings, or ribbon*) or Magnesium aluminum powder	Flammable solid	UN1869	Flammable solid and Dangerous when wet	173.153	173.220	25	100	1.2	1.2	Segregation same as for flammable solids labeled Dangerous When Wet
	Magnesium nitrate	Oxidizer	UN1474	Oxidizer	173.153	173.182	25 pounds	100 pounds	1.2	1.2	
	Magnesium perchlorate	Oxidizer	UN1475	Oxidizer	173.153	173.154	25 pounds	100 pounds	1.3	1.3	Stow away from powdered metals
	Magnesium peroxide, solid	Oxidizer	UN1476	Oxidizer	173.153	173.154	25 pounds	100 pounds	1.2	1.2	Keep dry
	Magnesium scrap (*borings, clippings, shavings, sheet, turnings, or scalpings*)	Flammable solid	NA1869	Flammable solid and Dangerous when wet	173.153	173.220	Forbidden	Forbidden	1.2	1.2	Segregation same as for flammable solids labeled Dangerous When Wet
A	Magnetized material	ORM-C	UN2807	Magnetized material	None	173.1020	No limit	No limit			
EA	Malathion (*RQ-10/4.54*)	ORM-A	NA2783	None	173.505	173.510	No limit	No limit	1.2	1.2	
EA	Maleic acid (*RQ-5000/2270*)	ORM-A	NA2215	None	173.505	173.510	50 pounds	200 pounds	1.2	1.2	Keep tightly closed
EAW	Maleic anhydride (*RQ-5000/2270*)	ORM-A	UN2215	None	173.505	173.510	50 pounds	200 pounds	1.2	1.2	Stow away from foodstuffs
	Mannitan tetranitrate	Forbidden									
	Matches, block. See Matches, strike anywhere										
	Matches, safety, *book, card, or strike-on box*	Flammable solid	UN1944	None	173.176	None	50 pounds	50 pounds	1.2	1.2	
	Matches, strike anywhere	Flammable solid	UN1331	Flammable solid	None	173.176a	Forbidden	Forbidden	1.2	1	
E	Matting acid. *See* Sulfuric acid										
	Medicines, n.o.s.	Combustible liquid	UN1851	None	173.118a	None	No limit	No limit	1.2	1.2	
	Medicines, n.o.s.	Flammable liquid	UN1851	Flammable liquid	173.118	173.119	1 quart	10 gallons	1.2	1	
	Medicines, n.o.s.	Flammable solid	UN1851	Flammable solid	173.153	173.154	25 pounds	100 pounds	1.2	1.2	
	Medicines, n.o.s.	Oxidizer	UN1851	Oxidizer	173.153	173.154	25 pounds	100 pounds	1.2	1.2	
	Medicines, liquid, n.o.s.	Corrosive material	UN1851	Corrosive	173.244	173.245	1 quart	1 quart	1.2	1.2	
	Medicines, liquid, n.o.s.	Poison B	UN1851	Poison	173.345	173.346	1 quart	55 gallons	1.3	1	
	Medicines, solid, n.o.s.	Corrosive material	UN1851	Corrosive	173.244	173.245b	25 pounds	100 pounds	1.2	1.2	Keep dry
	Medicines, solid, n.o.s.	Poison B	UN1851	Poison	173.364	173.365	50 pounds	200 pounds	1.3	1.3	
	p-Menthane hydroperoxide, *technically pure. See* Paramenthane hydroperoxide		UN2125								
	Mercaptan mixture, aliphatic	Flammable liquid	NA1228	Flammable liquid	None	173.141	Forbidden	10 gallons	1.3	5	
	Mercaptan mixture, aliphatic (*in containers over 110 gallons*)	Combustible liquid	NA1228	None	173.118a	None	Forbidden	10 gallons	1.2	1.2	

Hazardous Materials Table—Continued

(1)	(2)	(3)	(3A)	(4)	(5) Packaging		(6) Maximum net quantity in one package		(7) Water shipments		
+ E A W	Hazardous materials descriptions and proper shipping names	Hazard class	Identification number	Label(s) required (if not excepted)	(a) Exceptions	(b) Specific requirements	(a) Passenger carrying aircraft or railcar	(b) Cargo aircraft only	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
AW	Mercaptan mixture, aliphatic *(in containers of 110 gallons or less). See 173.141(b)*	ORM-A	NA1228	None	173.505	173.510	Forbidden	10 gallons	1,3	5	Stow in well ventilated space away from living quarters
E	Mercaptodimethur ***(RQ-100/45.4)***	ORM-E	NA2757	None	None	173.510	No limit	No limit	1,2	1,2	
+	Mercuric acetate	Poison B	UN1629	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
+	Mercuric ammonium chloride, solid	Poison B	UN1630	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
+	Mercuric benzoate, solid	Poison B	UN1631	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
+	Mercuric bromide, solid	Poison B	UN1634	Poison	173.364	173.365	Forbidden	25 pounds	1,2	1,2	
	Mercuric chloride, solid	Poison B	UN1624	Poison	173.364	173.372	Forbidden	25 pounds	1,2	1,2	
+E	Mercuric cyanide, solid ***(RQ-1/.454)***	Poison B	UN1636	Poison	173.370	173.370	25 pounds	200 pounds	1,2	1,2	Stow away from acids
	Mercuric iodide, solid	Poison B	UN1638	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
	Mercuric iodide, solution	Poison B	UN1638	Poison	173.345	173.346	1 quart	55 gallons	1,2	1,2	
E	Mercuric nitrate ***(RQ-10/4.54)***	Oxidizer	UN1625	Oxidizer	173.153	173.182	25 pounds	100 pounds	1,2	1,2	If stowed under deck, must be stowed in a recoverable location.
+	Mercuric oleate, solid	Poison B	UN1640	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
	Mercuric oxide, solid	Poison B	UN1641	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
+	Mercuric oxycyanide, solid (desensitized)	Poison B	UN1642	Poison	173.364	173.365	25 pounds	200 pounds	1,2	1,2	Stow away from acids
+	Mercuric potassium cyanide, solid	Poison B	UN1626	Poison	173.364	173.365 173.370	25 pounds	200 pounds	1,2	1,2	Stow away from acids
+	Mercuric potassium iodide, solid	Poison B	UN1643	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
+	Mercuric salicylate, solid	Poison B	UN1644	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
+	Mercuric subsulfate, solid	Poison B	NA9025	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
+E	Mercuric sulfate, solid ***(RQ-10/4.54)***	Poison B	UN1645	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
+E	Mercuric sulfocyanate, solid *or* Mercuric thiocyanate, solid ***(RQ-10/4.54)***	Poison B	UN1646	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
+	Mercurol *or* Mercury nucleate, solid	Poison B	UN1639	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
+	Mercurous acetate, solid	Poison B	UN1629	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
	Mercurous azide	Forbidden									
+	Mercurous bromide, solid	Poison B	UN1634	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
+	Mercurous gluconate, solid	Poison B	UN1637	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
+	Mercurous iodide, solid	Poison B	UN1638	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
E	Mercurous nitrate, solid ***(RQ-10/4.54)***	Oxidizer	UN1627	Oxidizer	173.153	173.154	50 pounds	100 pounds	1,2	1,2	
+	Mercurous oxide, black, solid	Poison B	UN1641	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
+	Mercurous sulfate, solid	Poison B	UN1628	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
	Mercury acetylide	Forbidden									
	Mercury based pesticide, liquid, n.o.s. *(compounds and preparations)*.	Flammable liquid	UN2778	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Mercury based pesticide, liquid, n.o.s. *(compounds and preparations)*.	Poison B	UN2777	Poison	173.345	173.346	1 quart	55 gallons	1,2	1,2	
	Mercury based pesticide, solid, n.o.s. *(compounds and preparations)*.	Poison B	UN2777	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
	Mercury compound, solid, n.o.s.	Poison B	UN2025	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	

	Mercury fulminate See Initiating explosive										
	Mercury iodide aquabasic ammonobasic (Iodide of Million's base)	Forbidden									
A	Mercury, metallic	ORM-B	NA2809	None	None	173.980	173.980	See 173.980			
	Mercury nitride	Forbidden									
	Mercury oxycyanide	Forbidden									
	Mesityl oxide	Flammable liquid	UN1229	Flammable liquid	None	173.119	1 quart	10 gallons	1,2	1,2	
	Metal alkyl, solution, n.o.s.	Flammable liquid	NA9195	Flammable liquid	173.118	173.119	1 quart	1 gallon	1,2	1	
W	Metal borings, shavings, turnings, or cuttings (*ferrous metals only, except stainless steel*)	ORM-C	UN2793	None	173.505	173.1025			1,2	1,2	Keep dry, not permitted if temperature of material is at or above 130 deg F
	Metal salts of methyl nitramine (dry)	Forbidden									
+	Methane *or* Methane, compressed	Flammable gas	UN1971	Flammable gas	173.306	173.302	Forbidden	300 pounds	1,2	4	Stow away from living quarters
	Methane, refrigerated liquid (*cryogenic liquid*)	Flammable gas	UN1972	Flammable gas	None	173.318	Forbidden	Forbidden	1	5	Stow away from living quarters
	Methanol See Methyl alcohol										
	Methazoic acid	Forbidden									
E	Methoxychlor (*RQ-1/0.454*)	ORM-E	NA2761	None	None	173.510	No limit	No limit	1,2	1,2	
	Methyl acetate	Flammable liquid	UN1231	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Methyl acetone	Flammable liquid	UN1232	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
+	Methylacetylene-propadiene, stabilized	Flammable gas	UN1060	Flammable gas	173.306	173.304 173.314 173.315	Forbidden	300 pounds	1,2	1	
	Methyl acrylate, inhibited	Flammable liquid	UN1919	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Methylal	Flammable liquid	UN1234	Flammable liquid	None	173.119	Forbidden	10 gallons	1,3	5	
	Methyl alcohol	Flammable liquid	UN1230	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
+ E	Methylamine, anhydrous (*RQ-1000/454*)	Flammable gas	UN1061	Flammable gas	173.306	173.304 173.314 173.315	Forbidden	300 pounds	1	4	
E	Methylamine, aqueous solution (*RQ-1000/454*)	Flammable liquid	UN1235	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,3	4	Stow away from mercury and its compounds
	Methylamine dinitramine and dry salts thereof	Forbidden									
	Methylamine nitroform	Forbidden									
	Methylamine perchlorate (dry)	Forbidden									
	Methylamyl acetate	Flammable liquid	UN1233	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1,2	
	Methyl amyl ketone	Combustible liquid	UN1110	None	173.118a	None	No limit	No limit	1,2	1,2	
+	Methyl bromide and more than 2% chloropicrin mixture, liquid	Poison B	NA1581	Poison	None	173.353	Forbidden	Forbidden	1	5	Shade from radiant heat
+	Methyl bromide and nonflammable, nonliquefied compressed gas mixture, liquid (*including up to 2% chloropicrin*)	Poison B	NA1955	Poison	None	173.353a	Forbidden	300 pounds	1	5	Stow away from living quarters
+ E	Methyl bromide - ethylene dibromide mixture, liquid (*RQ-1000/454*)	Poison B	UN1647	Poison	None	173.353	Forbidden	55 gallons	1	1	
+	Methyl bromide, liquid (*including up to 2% chloropicrin*)	Poison B	UN1062	Poison	None	173.353	Forbidden	55 gallons	1	5	Stow away from living quarters. Segregation same as for nonflammable gas.

Hazardous Materials Table—Continued

(1)	(2)	(3)	(3A)	(4)	(5) Packaging		(6) Maximum net quantity in one package		(7) Water shipments		
+ E A W	Hazardous materials descriptions and proper shipping names	Hazard class	Identification number	Label(s) required (if not excepted)	(a) Exceptions	(b) Specific requirements	(a) Passenger carrying aircraft or railcar	(b) Cargo aircraft only	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Methyl butene	Flammable liquid	UN2460	Flammable liquid	None	173.119	Forbidden	10 gallons	1,2	5	
	Methyl butyrate	Flammable liquid	UN1237	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Methyl cellosolve. *See* **Ethylene glycol monomethyl ether**										
	Methyl cellosolve acetate. *See* **Ethylene glycol monomethyl ether acetate**										
+	**Methyl chloride**	Flammable gas	UN1063	Flammable gas	173.306	173.304 173.314 173.315	Forbidden	300 pounds	1,2	4	
+	**Methyl chloride-methylene chloride mixture**	Flammable gas	UN1912	Flammable gas	173.306	173.304 173.314	Forbidden	300 pounds	1,2	4	
	Methyl chlorocarbonate. *See* **Methyl chloroformate**										
A	**Methyl chloroform.** *See* **1,1,1-Trichloroethane**										
	Methyl chloroformate	Flammable liquid	UN1238	Flammable liquid and Poison	None	173.288	Forbidden	5 pints	1,2	1	
	Methylchloromethyl ether, anhydrous	Flammable liquid	UN1239	Flammable liquid and Poison	None	173.143	Forbidden	Forbidden	1	5	Shade from radiant heat
	Methyl cyanide	Flammable liquid	UN1648	Flammable liquid	173.118	173.119	1 quart	10 gallons	1	4	Shade from radiant heat
	Methylcyclohexane	Flammable liquid	UN2296	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Methylcyclopentane	Flammable liquid	UN2298	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,3	4	
	Methyl dichloroacetate	Corrosive material	UN2299	Corrosive	173.244	173.245	1 quart	1 quart	1,2	1,2	
	Methyldichloroarsine	Poison A	NA1556	Poison gas	None	173.328	Forbidden	Forbidden	1	5	Shade from radiant heat
	Methyl dichlorosilane	Flammable liquid	UN1242	Flammable liquid	None	173.136	Forbidden	5 pints	1,2	1	
	Methylene chloride. *See* **Dichloromethane**										
	Methylene glycol dinitrate	Forbidden									
	Methyl ethyl ether. *See* **Ethyl methyl ether**										
	Methyl ethyl ketone	Flammable liquid	UN1193	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	

	Methyl ethyl ketone peroxide, *in solution with not more than 9% by weight active oxygen. See* Organic peroxide, liquid, *or* solution, n.o.s.		UN2550								
	Methyl ethyl ketone peroxide, in solution with more than 9% by weight active oxygen	Forbidden									
	Methyl ethyl pyridine	Corrosive material	UN2300	Corrosive	173.244	173.245	1 quart	10 gallons	1,2	1,2	
	Methyl formate	Flammable liquid	UN1243	Flammable liquid	173.118	173.119	Forbidden	10 gallons	1,3	4	
	Methylfuran	Flammable liquid	UN2301	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,3	4	
	a-Methylglucoside tetranitrate	Forbidden									
	a-Methylglycerol trinitrate	Forbidden									
	Methylhydrazine	Flammable liquid	UN1244	Flammable liquid and Poison	None	173.145	Forbidden	5 pints	1,2	1	Stow separate from oxidizing materials and corrosives
	Methyl isobutyl ketone peroxide, *in solution with not more than 9% by weight active oxygen. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2126								
	Methyl isobutyl ketone peroxide, in solution with more than 9% by weight active oxygen	Forbidden									
	Methyl isocyanate	Flammable liquid	UN2480	Flammable liquid and Poison	None	173.119 173.3a	Forbidden	10 gallons	1	5	Keep cool. Stow away from living quarters and sources of heat
	Methyl isopropenyl ketone, inhibited	Flammable liquid	UN1246	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Methyl magnesium bromide in ethyl ether *not over 40% concentration*	Flammable liquid	UN1928	Flammable liquid	None	173.149	Forbidden	Forbidden	1	1	Segregation same as for flammable solids. Separate from flammable gases or liquids, oxidizing materials or organic peroxides
+E	Methyl mercaptan (*RQ-100/45.4*)	Flammable gas	UN1064	Flammable gas	173.306	173.304 173.314 173.315	Forbidden	300 pounds	1,2	1	
E	Methyl methacrylate monomer, inhibited (*RQ-5000/2270*)	Flammable liquid	UN1247	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
E	Methyl methacrylate monomer, uninhibited (*high-purity, if acceptable under 173.21 of this subchapter*) (*RQ-5000/2270*)	Flammable liquid	NA1247	Flammable liquid	173.118	173.119	Forbidden	Forbidden	1,2	1	
	Methyl nitrate	Forbidden									
	N-Methyl-N'-nitro-N-nitrosoguanidine (*not exceeding 25 grams in one outside packaging*)	Flammable solid	NA1325	Flammable solid	None	173.179	Forbidden	Forbidden	4	5	
	Methyl norbornene dicarboxylic anhydride. *See* Memtetrahydro phthalic anhydride										
E	Methyl parathion, liquid (*RQ-100/45.4*)	Poison B	NA2783	Poison	None	173.358	Forbidden	1 quart	1,3	1,3	
E	Methyl parathion mixture, dry (*RQ-100/45.4*)	Poison B	NA2783	Poison	173.377	173.377	50 pounds	200 pounds	1,2	1,2	
E	Methyl parathion mixture, liquid, (containing 25% or less methyl parathion) (*RQ-100/45.4*)	Poison B	NA2783	Poison	None	173.359	1/2 pint	1 quart	1,2	1,2	
E	Methyl parathion mixture, liquid, (*containing over 25% methyl parathion*) (*RQ-100/45.4*)	Poison B	NA2783	Poison	None	173.359	Forbidden	1 quart	1,2	1,2	
	Methylpentadiene	Flammable liquid	UN2461	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	

Hazardous Materials Table—Continued

(1)	(2)	(3)	(3A)	(4)	(5) Packaging		(6) Maximum net quantity in one package		(7) Water shipments		
+ E A W	Hazardous materials descriptions and proper shipping names	Hazard class	Identification number	Label(s) required (if not excepted)	(a) Exceptions	(b) Specific requirements	(a) Passenger carrying aircraft or railcar	(b) Cargo aircraft only	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Methyl pentane	Flammable liquid	UN2462	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Methyl phosphonothioic dichloride, anhydrous	Corrosive material	NA1760	Corrosive	173.244	173.245 173.245a	1 quart	1 quart	1	4	
	Methyl phosphonic dichloride	Corrosive material	NA9206	Corrosive and Poison	None	173.271	Forbidden	1 quart	1	1	Keep dry. Glass carboys not permitted on passenger vessels
	Methyl phosphonous dichloride. *See* Pyroforic liquid, n.o.s.										
	Methyl picric acid (heavy metal salts of)	Forbidden									
	Methyl propionate	Flammable liquid	UN1248	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Methyl propyl ketone	Flammable liquid	UN1249	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Methyl sulfate. *See* Dimethyl sulfate										
	Methyl sulfide. *See* Dimethyl sulfide										
	Methyltrichlorosilane	Flammable liquid	UN1250	Flammable liquid	None	173.135	Forbidden	10 gallons	1,2	1	
	Methyl trimethylol methane trinitrate	Forbidden									
	Methyl vinyl ketone, inhibited	Flammable liquid	UN1251	Flammable liquid	173.147	173.147	4 ounces	10 gallons	1,2	1	
E	Mevinphos (*RQ-1/0.454*)	Poison B	NA2783	Poison	None	173.358	Forbidden	1 quart	1,2	5	
E	Mevinphos mixture, dry (*RQ-1/0.454*)	Poison B	NA2783	Poison	173.377	173.377	Forbidden	200 pounds	1,2	4	
E	Mevinphos mixture, liquid (*RQ-1/0.454*)	Poison B	NA2783	Poison	173.359	173.359	½ pint	1 quart	1,2	5	
E	Mexacarbate (*RQ-1000/454*)	Poison B	NA2757	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
	Mild detonating fuse, metal clad. See Fuse, mild detonating, metal clad										
	Mine, empty. See 173.55										
	Mine, explosive, with gaseous material. See Explosive mine										
	Mine rescue equipment containing carbon dioxide	Nonflammable gas	NA1956	Nonflammable gas	173.306		150 pounds	300 pounds	1,2	1,2	
	Mining reagent, liquid (*containing 20% or more cresylic acid*)	Corrosive material	NA2022	Corrosive	173.244	173.249a	1 quart	10 gallons	1,2	1,2	
A	Mipafox	ORM-A	UN2783	None	173.505	173.510	No limit	No limit			
E	Mixed acid. *See* Nitrating acid										
A	Molybdenum pentachloride	ORM-B	UN2508	None	173.505	173.800	25 pounds	100 pounds			
	Monochloroacetone, stabilized *or* inhibited	Irritating material	UN1695	Irritant	None	173.384	Forbidden	5 gallons	1	1	Stow away from living quarters
	Monochloroacetone (unstabilized)	Forbidden									
	Monochloroethylene. *See* Vinyl chloride										

	Monoethanolamine	Corrosive material	UN2491	Corrosive	173.244	173.245	1 quart	10 gallons	1,2	1,2	
E	**Monoethylamine** (*RQ-1000/454*)	Flammable liquid	UN1036	Flammable liquid	None	173.148	Forbidden	5 pints	1,2	5	Segregation same as for flammable gas
	Monofluorophosphoric acid, anhydrous	Corrosive material	UN1776	Corrosive	None	173.275	Forbidden	1 gallon	1,2	1,2	Keep dry
	Morpholine	Flammable liquid	UN2054	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Morpholine, aqueous, mixture	Flammable liquid	NA2054	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Morpholine, aqueous, mixture	Corrosive material	NA1760	Corrosive	173.244	173.245	1 quart	10 gallons	1	4	
	Moth balls. See **Naphthalene**										
	Motion picture film. See **Film**										
+ E	**Motor fuel antiknock compound** *or* **Antiknock compound** (*these materials may contain various hazardous substances for which the appropriate RQ applies*)	Poison B	UN1649	Poison	None	173.354	Forbidden	55 gallons	1	5	If flashpoint less than 141 deg F, segregation same as for flammable liquids
	Motor, internal combustion										
+ E	**Motor vehicle**, *etc., including automobile, motorcycle, truck, tractor, and other self-propelled vehicle or equipment powered by internal combustion engine, when offered new or used for transportation and which contain fuel in the engine or fuel tank or the electric storage battery is connected to either terminal of the electrical system*	ORM-C		None	173.120 173.120 173.250 173.257 173.306 175.305 176.905				1,2	1,2	
E	**Muriatic acid.** *See* **Hydrochloric acid**										
E	**Naled** (*RQ-10/4.54*)	ORM-E	NA2783	None	None	173.510	No limit	No limit	1,2	1,2	
	Naphtha	Combustible liquid	UN2553	None	173.118a	None	No limit	No limit	1,2	1,2	
	Naphtha	Flammable liquid	UN2553	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
E A W	**Naphthalene** *or* **Naphthalin** (*RQ-5000/2270*)	ORM-A	UN1334	None	173.505	173.655	25 pounds	300 pounds	1,2	1,2	Segregation same as for flammable solids
	Naphthalene diozonide	Forbidden									
	Naphtha petroleum. See **Petroleum naphtha**										
E	**Naphthenic acid** (*RQ-100/45.4*)	ORM-E	NA9137	None	None	173.510	No limit	No limit	1,2	1,2	
	Naphthyl amineperchlorate	Forbidden									
	Natural gas, refrigerated liquid (*with high methane content*) (*cryogenic liquid*)	Flammable gas	UN1972	Flammable gas	None	173.318	Forbidden	Forbidden	1	5	Stow away from living quarters
	Natural gasoline. See **Gasoline**										
	Neohexane	Flammable liquid	UN1208	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,3	4	
	Neon *or* **Neon, compressed**	Nonflammable gas	UN1065	Nonflammable gas	173.306	173.302	150 pounds	300 pounds	1,2	1,2	
	Neon, refrigerated liquid (*cryogenic liquid*)	Nonflammable gas	UN1913	Nonflammable gas	173.320	173.316	100 pounds	1,100 pounds	1,3	1,3	
	New explosive or explosive device. See 173.51 and 173.86										
E	**Nickel ammonium sulfate** (*RQ-5000/2270*)	ORM-E	NA9138	None	None	173.510	No limit	No limit	1,2	1,2	
	Nickel carbonyl	Flammable liquid	UN1259	Flammable liquid and Poison	None	173.126	Forbidden	Forbidden	1	5	Shade from radiant heat. Segregation same as for flammable liquids. Not permitted on a vessel transporting explosives, except that quantities not exceeding 200 pounds may be transported on such vessels under conditions approved by the Captain of the Port
E	**Nickel chloride** (*RQ-5000/2270*)	ORM-E	NA9139	None	None	173.510	No limit	No limit	1,2	1,2	

Hazardous Materials Table—Continued

(1) +/E/A/W	(2) Hazardous materials descriptions and proper shipping names	(3) Hazard class	(3A) Identification number	(4) Label(s) required (if not excepted)	(5) Packaging (a) Exceptions	(5) Packaging (b) Specific requirements	(6) Maximum net quantity in one package (a) Passenger carrying aircraft or railcar	(6) Maximum net quantity in one package (b) Cargo aircraft only	(7) Water shipments (a) Cargo vessel	(7) Water shipments (b) Passenger vessel	(7) Water shipments (c) Other requirements
+	Nickel cyanide, solid	Poison B	UN1653	Poison	173.370		25 pounds	200 pounds	1,2	1,2	Stow away from acids
E	Nickel hydroxide (*RQ-1000/454*)	ORM-E	NA9140	None	None	173.510	No limit	No limit	1,2	1,2	
E	Nickel nitrate (*RQ-5000/2270*)	Oxidizer	UN2725	Oxidizer	173.153	173.182	25 pounds	100 pounds	1,2	1,2	
	Nickel picrate	Forbidden									
E	Nickel sulfate (*RQ-5000/2270*)	ORM-E	NA9141	None	None	173.510	No limit	No limit	1,2	1,2	
	Nicotine hydrochloride	Poison B	UN1656	Poison	173.345	173.346	1 quart	55 gallons	1,2	1,2	
	Nicotine, liquid	Poison B	UN1654	Poison	None	173.346	Forbidden	55 gallons	1,2	1,2	
	Nicotine salicylate	Poison B	UN1657	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
+	Nicotine sulfate, liquid	Poison B	UN1658	Poison	173.345	173.346	1 quart	55 gallons	1,2	1,2	
+	Nicotine sulfate, solid	Poison B	UN1658	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
	Nicotine tartrate	Poison B	UN1659	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
	Nitrated paper (unstable)	Forbidden									
	Nitrate, n.o.s.	Oxidizer	NA1477	Oxidizer	173.153	173.182	25 pounds	100 pounds	1,2	1,2	
	Nitrate of ammonia explosives. See High explosive										
	Nitrates of diazonium compounds	Forbidden									
E	Nitrating acid, mixture (with not more than 50% nitric acid) (*RQ-1000/454*)	Corrosive material	UN1796	Corrosive	None	173.267	Forbidden	1 quart	1	5	Stow away from fluorides
E	Nitrating acid, mixture (with more than 50% nitric acid) (*RQ-1000/454*)	Oxidizer	UN1796	Oxidizer and Corrosive	None	173.267	Forbidden	1 quart	1	5	Segregation same as for corrosive material. Stow away from fluorides
E	Nitrating acid, spent (*RQ-1000/454*)	Corrosive material	NA1826	Corrosive	None	173.248	Forbidden	1 quart	1	5	
E	Nitric acid (*over 40%*) (*RQ-1000/454*)	Oxidizer	UN2031	Oxidizer and Corrosive	None	173.268	Forbidden	5 pints	1	5	Segregation same as for corrosive materials. Stow away from hydrazine, separate from diethylenetriamine
E	Nitric acid, 40% or less (*RQ-1000/454*)	Corrosive material	NA1760	Corrosive	None	173.268	Forbidden	5 pints	1	5	Stow away from hydrazine, separate from diethylenetriamine
E	Nitric acid, fuming (*RQ-1000/454*)	Oxidizer	UN2032	Oxidizer and Poison	None	173.268	Forbidden	Forbidden	1	5	Segregation same as for corrosive materials. Stow away from hydrazine, separate from diethylenetriamine
	Nitric ether. See Ethyl nitrate										
	Nitric oxide	Poison A	UN1660	Poison gas	None	173.337	Forbidden	Forbidden	1	5	
	2-Nitro-2-methylpropanol nitrate	Forbidden									
	6-Nitro-4-diazotoluene-3-sulfonic acid (dry)	Forbidden									
	p-Nitroaniline. *See* Nitroaniline										
	N-Nitroaniline	Forbidden									
+	Nitroaniline	Poison B	UN1661	Poison	173.364	173.373	50 pounds	200 pounds	1,2	1,2	
	m-Nitrobenzene diazonium perchlorate	Forbidden									
E	Nitrobenzene, liquid *or* Nitrobenzol, liquid (*oil of mirbane*) (*RQ-1000/454*)	Poison B	UN1662	Poison	173.345	173.346	1 quart	55 gallons	1,2	1,2	
	Nitro carbonitrate. See Blasting agent, n.o.s.										

	Nitrocellulose, colloided, granular *or* flake, wet with not less than 20% alcohol *or* solvent, *or* block, wet with not less than 25% alcohol	Flammable liquid	NA2059	Flammable liquid	173.118	173.127	1 quart	25 pounds	1,3	1	
	Nitrocellulose, colloided, granular *or* flake, wet with not less than 20% water	Flammable solid	NA2555	Flammable solid	173.153	173.184	25 pounds	100 pounds	1,3	1	
	Nitrocellulose, dry. See High explosive										
	Nitrocellulose, wet with not less than 30% alcohol *or* solvent	Flammable liquid	NA2556	Flammable liquid	173.118	173.127	1 quart	25 pounds	1,3	1	
	Nitrocellulose, wet with not less than 20% water	Flammable solid	NA2555	Flammable solid	173.153	173.184	25 pounds	100 pounds	1,3	1	
+	Nitrochlorobenzene, meta *or* para, solid	Poison B	UN1578	Poison	173.364	173.374	50 pounds	200 pounds	1,2	1,2	
+	Nitrochlorobenzene, ortho, liquid	Poison B	UN1578	Poison	173.345	173.346	1 quart	55 gallons	1,2	1,2	
	Nitroethylene polymer	Forbidden									
	Nitroethyl nitrate	Forbidden									
	Nitrogen *or* Nitrogen, compressed	Nonflammable gas	UN1066	Nonflammable gas	173.306	173.302 173.314	150 pounds	300 pounds	1,2	1,2	
	Nitrogen, refrigerated liquid (*cryogenic liquid*)	Nonflammable gas	UN1977	Nonflammable gas	173.320	173.316 173.318	100 pounds	1,100 pounds	1,3	1,3	
E	Nitrogen dioxide, liquid (*RQ-1000/454*)	Poison A	UN1067	Poison gas and Oxidizer	None	173.336	Forbidden	Forbidden	1	5	Segregation same as for nonflammable gases. Stow away from organic materials
E	Nitrogen peroxide, liquid (*RQ-1000/454*)	Poison A	NA1067	Poison gas and oxidizer	None	173.336	Forbidden	Forbidden	1	5	Segregation same as for nonflammable gases. Stow away from organic materials
E	Nitrogen tetroxide, liquid (*RQ-1000/454*)	Poison A	NA1067	Poison gas and oxidizer	None	173.336	Forbidden	Forbidden	1	5	Segregation same as for nonflammable gases. Stow away from organic materials
	Nitrogen trichloride	Forbidden									
	Nitrogen trifluoride	Nonflammable gas	UN2451	Nonflammable gas	None	173.302	Forbidden	300 pounds	1	5	Stow away from living quarters and organic materials
	Nitrogen triiodide	Forbidden									
	Nitrogen triiodide monoamine	Forbidden									
	Nitroglycerin, liquid, desensitized. See High explosive, liquid										
	Nitroglycerin, liquid, not desensitized. See 173.51	Forbidden									
	Nitroglycerin, spirits of. See Spirits of nitroglycerin										
	Nitroguanidine, dry. See High explosive										
	Nitroguanidine nitrate	Forbidden									
	Nitroguanidine, wet with not less than 20% water	Flammable solid	UN1336	Flammable solid	173.153	173.184	25 pounds	100 pounds	1,2	4	
	1-Nitro hydantoin	Forbidden									
E	Nitrohydrochloric acid (*RQ-1000/454*)	Corrosive material	UN1798	Corrosive	None	173.278	Forbidden	5 pints	1	5	
E	Nitrohydrochloric acid, diluted (*RQ-1000/454*)	Corrosive material	UN1798	Corrosive	None	173.278	Forbidden	5 pints	1	5	
	Nitro isobutane triol trinitrate	Forbidden									
	Nitromannite. See High explosive										
	Nitromannite (dry)	Forbidden									
	Nitromethane	Flammable liquid	UN1261	Flammable liquid	173.118	173.149a	1 quart	10 gallons	1,2	1,2	
E	Nitromuriatic acid. *See* Nitrohydrochloric acid										
	N-Nitro-N-methylglycolamide nitrate	Forbidden									
E	Nitrophenol (*RQ-1000/454*)	ORM-E	UN1663	None	None	173.510	No limit	No limit	1,2	1,2	

Hazardous Materials Table—Continued

(1)	(2)	(3)	(3A)	(4)	(5) Packaging		(6) Maximum net quantity in one package		(7) Water shipments		
+/E/A/W	Hazardous materials descriptions and proper shipping names	Hazard class	Identification number	Label(s) required (if not excepted)	(a) Exceptions	(b) Specific requirements	(a) Passenger carrying aircraft or railcar	(b) Cargo aircraft only	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Nitrophenol pesticide, substituted, liquid or solid, n.o.s. (*compounds and preparations*) *See* Substituted nitrophenol pesticide, liquid *or* solid, n.o.s. (*compounds and preparations*)										
	m-Nitrophenyldinitro methane	Forbidden									
	Nitrosoguanidine. *See* Initiating explosive										
	Nitrostarch, dry. *See* High explosive										
	Nitrostarch, wet with not less than 30% alcohol *or* solvent	Flammable liquid	UN1337	Flammable liquid	173.118	173.127	1 quart	25 pounds	1,2	1	
	Nitrostarch, wet with not less than 20% water	Flammable solid	UN1337	Flammable solid	173.153	173.184	25 pounds	100 pounds	1	4	
	Nitrosugars (dry)	Forbidden									
	Nitrosyl chloride	Nonflammable gas	UN1069	Nonflammable gas	173.306	173.304 173.314	Forbidden	300 pounds	1	4	
E	Nitrotoluene (*RQ-1000/454*)	ORM-E	UN1664	None	None	173.510	No limit	No limit	1,2	1,2	
	Nitrourea. *See* High explosive										
	Nitrous oxide *or* Nitrous oxide, compressed	Nonflammable gas	UN1070	Nonflammable gas	173.306	173.304	150 pounds	300 pounds	1,2	1,2	Under deck stowage must be in well ventilated space
	Nitrous oxide, refrigerated liquid	Nonflammable gas	UN2201	Nonflammable gas	173.306	173.315	Forbidden	Forbidden	1	1	Stow away from flammables. Do not overstow with other cargo
+	Nitroxylol	Poison B	NA1665	Poison	173.345	173.346	1 quart	55 gallons	1,2	1	
	Nonflammable gas, n.o.s. *See* Compressed gas, n.o.s.										
+	Nonliquefied hydrocarbon gas. *See* Hydrocarbon gas, nonliquefied										
	Nonyltrichlorosilane	Corrosive material	UN1799	Corrosive	None	173.280	Forbidden	10 gallons	1	1	Keep dry
E	Nordhausen acid. *See* Sulfuric acid										
	Octadecyltrichlorosilane	Corrosive material	UN1800	Corrosive	None	173.280	Forbidden	10 gallons	1	1	Keep dry
	1,7-Octadiene-3,5-diyne-1,8-dimethoxy-9-octadecynoic acid	Forbidden									
	Octane	Flammable liquid	UN1262	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	n-Octanoyl peroxide, *technically pure.* *See* Organic peroxide, liquid *or* solution, n.o.s.		UN2129								
	Octyltrichlorosilane	Corrosive material	UN1801	Corrosive	None	173.280	Forbidden	10 gallons	1	1	Keep dry

	Oil, *described as oil*, Oil, n.o.s., Petroleum oil, *or* Petroleum oil, n.o.s	Combustible liquid	NA1270	None	173.118a	None	No limit	No limit	1,2	1,2	
	Oil, *described as oil*, Oil, n.o.s., Petroleum oil, *or* Petroleum oil, n.o.s.	Flammable liquid	NA1270	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Oil of mirbane. See Nitrobenzene, liquid										
	Oil of vitriol. See Sulfuric acid										
	Oil well cartridge	Class C explosive		Class C explosive	None	173.112	50 pounds	150 pounds	1,3	1,3	
E	Oleum (*fuming sulfuric acid*) (*RQ-1000/454*)	Corrosive material	NA1831	Corrosive	None	173.272	Forbidden	5 pints	1,2	1	Under deck stowage must be in metal drums only. Keep dry.
	Organic peroxide, liquid *or* solution, n.o.s.	Flammable liquid	NA1993	Flammable liquid and Organic peroxide	None	173.119	Forbidden	1 quart	1,2	5	Stow separate from combustible materials, explosives, or acids
	Organic peroxide, liquid *or* solution, n.o.s	Organic peroxide	NA9183	Organic peroxide	173.153	173.221	Forbidden	1 quart	1,2	1,2	Stow separate from combustible materials, explosives, or acids.
	Organic peroxide, mixture. *See* Organic peroxide, solid, n.o.s. *or* Organic peroxide, liquid *or* solution, n.o.s., *as appropriate*		UN2756								
	Organic peroxide, sample, n.o.s. *See* Organic peroxide, solid, n.o.s. *or* Organic peroxide, liquid *or* solution, n.o.s., *as appropriate*		UN2255								
	Organic peroxide, solid, n.o.s.	Organic peroxide	NA9187	Organic peroxide	173.153	173.154	Forbidden	25 pounds	1,2	1,2	Stow separate from combustible materials, explosives, or acids.
	Organic peroxide, trial quantity, n.o.s. *See* Organic peroxide, solid, n.o.s. *or* Organic peroxide, liquid *or* solution, n.o.s., *as appropriate*		UN2899								
	Organic phosphate mixture, Organic phosphate compound mixture, *or* Organic phosphorus compound mixture, liquid	Poison B	NA2783	Poison	173.359	173.359	1/2 pint	1 quart	1,2	5	
	Organic phosphate mixture, Organic phosphate compound mixture, *or* Organic phosphorus compound mixture, solid *or* dry	Poison B	NA2783	Poison	173.377	173.377	50 pounds	200 pounds	1,2	4	
	Organic phosphate, Organic phosphate compound, *or* Organic phosphorus compound, mixed with compressed gas	Poison A	NA1955	Poison gas	None	173.334	Forbidden	Forbidden	1	5	Shade from radiant heat
	Organic phosphate, Organic phosphate compound, *or* Organic phosphorus compound, liquid	Poison B	NA2783	Poison	None	173.358	Forbidden	1 quart	1,2	5	
	Organic phosphate, Organic phosphate compound, *or* Organic phosphorus compound, solid *or* dry	Poison B	NA2783	Poison	None	173.377	Forbidden	200 pounds	1,2	4	
	Organochlorine pesticide, liquid, n.o.s. (*compounds and preparations*),	Flammable liquid	UN2762	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Organochlorine pesticide, liquid, n.o.s (*compounds and preparations*),	Poison B	UN2761	Poison	173.345	173.346	1 quart	55 gallons	1,2	1,2	
	Organochlorine pesticide, solid, n.o.s. (*compounds and preparations*),	Poison B	UN2761	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
	Organophosphorus pesticide, liquid, n.o.s. (*compounds and preparations*),	Flammable liquid	UN2784	Flammable liquid	None	173.119	Forbidden	1 quart	1,2	5	
	Organophosphorus pesticide, liquid, n.o.s. (*compounds and preparations*),	Poison B	UN2783	Poison	173.359	173.359	Forbidden	1 quart	1,2	5	

AVAILABLE

Hazardous Materials Table—Continued

(1)	(2)	(3)	(3A)	(4)	(5) Packaging		(6) Maximum net quantity in one package		(7) Water shipments		
E A W	Hazardous materials descriptions and proper shipping names	Hazard class	Identification number	Label(s) required (if not excepted)	(a) Exceptions	(b) Specific requirements	(a) Passenger carrying aircraft or railcar	(b) Cargo aircraft only	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Organophosphorus pesticide, solid, n.o.s (*compounds and preparations*).	Poison B	UN2783	Poison	173.377	173.377	Forbidden	200 pounds	1,2	4	
	Organotin pesticide, liquid, n.o.s (*compounds and preparations*).	Flammable liquid	UN2787	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Organotin pesticide, liquid, n.o.s (*compounds and preparations*).	Poison B	UN2786	Poison	173.345	173.346	1 quart	55 gallons	1,2	1,2	
	Organotin pesticide, solid, n.o.s (*compounds and preparations*).	Poison B	UN2786	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
A	ORM-A, n.o.s	ORM-A	NA1693	None	173.505	173.510	No limit	No limit			
A	ORM-B, n.o.s	ORM-B	NA1760	None	173.505	173.510	No limit	No limit			
	ORM-C. See 173.500 and 176.900										
	Orthonitroaniline. *See* Nitroaniline										
	Oxidizer, corrosive, liquid, n.o.s	Oxidizer	NA9193	Oxidizer and Corrosive	None	173.245	Forbidden	1 quart	1	5	
	Oxidizer, corrosive, solid, n.o.s	Oxidizer	NA9194	Oxidizer and Corrosive	173.153	173.154	25 pounds	25 pounds	1	4	
	Oxidizer material packed with other articles. See 173.152										
	Oxidizer, n.o.s. *or* Oxidizing material, n.o.s	Oxidizer	UN1479	Oxidizer	173.153	173.154	25 pounds	25 pounds	1,2	1,2	
	Oxidizer, poisonous, liquid, n.o.s	Oxidizer	NA9199	Oxidizer and Poison	None	173.154	Forbidden	1 quart	1	5	
	Oxidizer, poisonous, solid, n.o.s	Oxidizer	NA9200	Oxidizer and Poison	173.153	173.154	25 pounds	25 pounds	1,2	4	
	Oxygen *or* Oxygen, compressed	Nonflammable gas	UN1072	Oxidizer	173.306	173.302 173.314	150 pounds	300 pounds	1,2	1,2	Under deck stowage must be in well ventilated space
	Oxygen, refrigerated liquid (*cryogenic liquid*)	Nonflammable gas	UN1073	Oxidizer	173.320	173.316 173.318	Forbidden	Forbidden	1	1	Stow separate from flammables. Do not overstow with other cargo
	Paint	Combustible liquid	UN1263	None	173.118a	None	No limit	No limit	1,2	1,2	
	Paint	Flammable liquid	UN1263	Flammable liquid	173.118	173.128	1 quart	55 gallons	1,2	1	
	Paint *or* paint related material	Corrosive material	NA1760	Corrosive	173.244	173.245	1 quart	1 gallon	1,2	1,2	
	Paint related material	Combustible liquid	NA1263	None	173.118a	None	No limit	No limit	1,2	1,2	
	Paint related material	Flammable liquid	NA1263	Flammable liquid	173.118 173.128	173.128	1 quart	55 gallons	1,2	1	
	Paper caps. See Toy caps										
EAW	Paraformaldehyde (*RQ-1000/454*)	ORM-A	UN2213	None	173.505	173.510	50 pounds	200 pounds	1,2	1,2	
	Paraldehyde	Flammable liquid	UN1264	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	

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	Paramenthane hydroperoxide	Organic peroxide	UN2125	Organic peroxide	173.153	173.224	1 quart	1 quart	1,2	4	
	Paranitroaniline, solid. *See* Nitroaniline										
E	Parathion and compressed gas mixture (*RQ-1/454*)	Poison A	NA1967	Poison gas	None	173.334	Forbidden	Forbidden	1,3	5	
E	Parathion, liquid (*RQ-1/0.454*)	Poison B	NA2783	Poison	None	173.358	Forbidden	1 quart	1,3	1,3	
E	Parathion mixture, dry (*RQ-1/0.454*)	Poison B	NA2783	Poison	173.377	173.377	50 pounds	200 pounds	1,3	1,3	
E	Parathion mixture, liquid (*RQ-1/0.454*)	Poison B	NA2783	Poison	None	173.359	Forbidden	1 quart	1,3	1,3	
E	Paris green, solid. *See* Copper acetoarsenite, solid										
E	PCB. *See* Polychlorinated biphenyls										
	Pelargonyl peroxide, *technically pure. See* Organic peroxide, solid, n.o.s.		UN2130								
	Pentaborane	Flammable liquid	UN1380	Flammable liquid and Poison	None	173.138	Forbidden	Forbidden	1	5	Segregation same as for flammable solids. Separate from flammable gases or liquids, oxidizing materials, or organic peroxides
E	Pentachlorophenol (*RQ-10/4.54*)	ORM-E	NA2020	None	None	173.510	No limit	No limit	1,2	1,2	
	Pentaerythrite tetranitrate. See Initiating explosive										
	Pentaerythrite tetranitrate, desensitized, wet. See High explosive										
	Pentaerythrite tetranitrate (dry)	Forbidden									
	Pentane	Flammable liquid	UN1265	Flammable liquid	173.118	173.119	Forbidden	10 gallons	1,3	4	
	Pentanitroaniline (dry)	Forbidden									
	Pentolite, dry. See High explosive										
	Peracetic acid solution, *not over 43% peracetic acid and not over 6% hydrogen peroxide*	Organic peroxide	NA2131	Organic peroxide	173.223	173.223	1 pint	5 pints	1	4	Shade from radiant heat
	Perchlorate, n.o.s.	Oxidizer	NA1481	Oxidizer	173.153	173.154	25 pounds	100 pounds	1,3	1,3	Stow away from powdered metals
	Perchloric acid, *exceeding 50% but not* exceeding 72% strength	Oxidizer	UN1873	Oxidizer	None	173.269	Forbidden	5 pints	1	5	Segregation same as for corrosive materials. Stow away from hydrazine.
	Perchloric acid exceeding 72% strength	Forbidden									
	Perchloric acid, not over 50% acid	Oxidizer	UN1802	Oxidizer	173.244	173.269	Forbidden	5 pints	1	1	Segregation same as for corrosive materials. Stow away from hydrazine
+	Perchloromethyl mercaptan	Poison B	UN1670	Poison	173.345	173.380	Forbidden	10 pounds	1	4	
	Percussion cap	Class C explosive		None	None	173.107	50 pounds	150 pounds	1,3	1,3	
	Percussion fuze	Class C explosive		Explosive C	None	173.105	50 pounds	150 pounds	1,3	1,3	
A	Perfluoro-2-butene	ORM-A	NA2422	None	173.505	173.605	10 gallons	55 gallons			
	Permanganate, n.o.s.	Oxidizer	NA1482	Oxidizer	173.153	173.154	25 pounds	100 pounds	1,2	1,2	Separate from ammonium compounds, hydrogen peroxide, and acids
E	*Permanganate of potash. See* Potassium permanganate										
	Peroxide, organic. See Organic Peroxide										
	Peroxyacetic acid, *not more than 43% and with not more than 6% hydrogen peroxide.* See Peracetic acid solution, *not over 43% peracetic acid and not over 6% hydrogen peroxide.*		UN2131								
	Peroxyacetic acid, more than 43% and with more than 6% hydrogen peroxide	Forbidden									
W	Pesticide, water reactive, *including but not limited to fungicides, and herbicides, etc., which contain manganese ethylenebisdithiocarbamate*	ORM-C	NA2210	None	173.505	173.1040			2	2	Keep dry

Hazardous Materials Table—Continued

(1) + E A W	(2) Hazardous materials descriptions and proper shipping names	(3) Hazard class	(3A) Identification number	(4) Label(s) required (if not excepted)	(5) Packaging (a) Exceptions	(5) Packaging (b) Specific requirements	(6) Maximum net quantity in one package (a) Passenger carrying aircraft or railcar	(6) Maximum net quantity in one package (b) Cargo aircraft only	(7) Water shipments (a) Cargo vessel	(7) Water shipments (b) Passenger vessel	(7) Water shipments (c) Other requirements
W	Petroleum coke (*uncalcined*)	ORM-C		None	173.505	173.1045			1,2	1,2	Not permitted if temperature of material is at or above 120 deg F
	Petroleum distillate	Combustible liquid	UN1268	None	173.118a	None	No limit	No limit	1,2	1,2	
	Petroleum distillate	Flammable liquid	UN1268	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,3	4	
	Petroleum ether	Flammable liquid	UN1271	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,3	4	
	Petroleum gas, liquefied. *See* Liquefied petroleum gas										
	Petroleum naphtha	Combustible liquid	UN1255	None	173.118a	None	No limit	No limit	1,2	1,2	
	Petroleum naphtha	Flammable liquid	UN1255	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Petroleum oil, n.o.s. *See* Oil										
A	Phencapton	ORM-A	NA2783	None	173.505	173.510	No limit	No limit			
+E	Phenol (*RQ-1000/454*)	Poison B	UN1671	Poison	173.364	173.369	50 pounds	250 pounds	1,2	1,2	
E	Phenol, liquid *or* solution (*liquid tar acid containing over 50% phenol*) (*RQ-1000/454*)	Poison B	NA2821	Poison	173.345	173.349	1 quart	55 gallons	1,2	1,2	
	Phenoxy pesticide, liquid, n.o.s. (*compounds and preparations*),	Flammable liquid	UN2766	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Phenoxy pesticide, liquid, n.o.s. (*compounds and preparations*),	Poison B	UN2765	Poison	173.345	173.346	1 quart	55 gallons	1,2	1,2	
	Phenoxy pesticide, solid, n.o.s. (*compounds and preparations*),	Poison B	UN2765	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
A	Phenylenediamine, meta *or* para, solid	ORM-A	UN1673	None	173.505	173.510	No limit	No limit			
	Phenyldichloroarsine	Poison B	NA1556	Poison	None	173.355	Forbidden	30 gallons	1	5	
	m-Phenylene diaminediperchlorate (dry)	Forbidden									
	Phenyl mercaptan	Poison B	UN2337	Poison	173.345	173.346	Forbidden	10 gallons	1,2	1	
	Phenyltrichlorosilane	Corrosive material	UN1804	Corrosive	None	173.280	Forbidden	10 gallons	1	1	Keep dry
	Phenylurea pesticide, liquid, n.o.s. (*compounds and preparations*),	Flammable liquid	UN2768	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Phenylurea pesticide, liquid, n.o.s. (*compounds and preparations*),	Poison B	UN2767	Poison	173.345	173.346	1 quart	55 gallons	1,2	1,2	
	Phenylurea pesticide, solid, n.o.s. (*compounds and preparations*),	Poison B	UN2767	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
E	Phosgene (*diphosgene*) (*RQ-5000/2270*)	Poison A	UN1076	Poison gas	None	173.333	Forbidden	Forbidden	1	5	

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	Phosphine	Poison A	UN2199	Poison gas and Flammable gas	None	173.328	Forbidden	Forbidden	1	5	Segregation same as for flammable gases
E	Phosphoric acid (*RQ-5000/2270*)	Corrosive material	UN1805	Corrosive	173.244	173.245	1 quart	10 gallons	1,2	1,2	Glass carboys in hampers not permitted under deck
	Phosphoric acid triethyleneimine. *See* Tris-(1-aziridinyl) phosphine oxide										
	Phosphoric anhydride (*phosphorus pentoxide*)	Corrosive material	NA1807	Corrosive	None	173.188	Forbidden	100 pounds	1,2	1,2	Keep dry. Glass bottles not permitted under deck
E	Phosphorus, amorphous, red (*RQ-1/0.454*)	Flammable solid	UN1338	Flammable solid	None	173.189	Forbidden	11 pounds	1,2	1,2	
	Phosphorus bromide. *See* Phosphorus tribromide										
E	Phosphorus chloride. *See* Phosphorus trichloride										
	Phosphorus heptasulfide	Flammable solid	UN1339	Flammable solid	None	173.225	Forbidden	10 pounds	1,2	1	Separate from oxidizing materials
	Phosphorus oxybromide	Corrosive material	UN1939	Corrosive	None	173.271	Forbidden	1 quart	1	1	Keep dry. Glass carboys not permitted on passenger vessels
E	Phosphorus oxychloride (*RQ-5000/2270*)	Corrosive material	UN1810	Corrosive	None	173.271	Forbidden	1 quart	1	1	Keep dry. Glass carboys not permitted on passenger vessels
	Phosphorus pentachloride, solid	Corrosive material	UN1806	Corrosive	None	173.191	Forbidden	5 pounds	1	1	Keep dry
E	Phosphorus pentasulfide (*RQ-100/45.4*)	Flammable solid	UN1340	Flammable solid and Dangerous when wet	None	173.225	Forbidden	11 pounds	1,2	1,2	Separate from oxidizing material
	Phosphorus sesquisulfide	Flammable solid	UN1341	Flammable solid and Dangerous when wet	None	173.225	Forbidden	11 pounds	1,2	1	Separate from oxidizing materials
	Phosphorus tribromide	Corrosive material	UN1808	Corrosive	None	173.270	Forbidden	1 quart	1	1	Keep dry. Glass carboys not permitted on passenger vessels
E	Phosphorus trichloride (*RQ-5000/2270*)	Corrosive material	UN1809	Corrosive	None	173.271	Forbidden	1 quart	1	1	Keep dry. Glass carboys not permitted on passenger vessels
	Phosphorus trisulfide	Flammable solid	UN1343	Flammable solid	None	173.225	Forbidden	10 pounds	1,2	1	Separate from oxidizing materials
E	Phosphorus, white *or* yellow, dry (*RQ-1/0.454*)	Flammable solid	UN1381	Flammable solid and Poison	None	173.190	Forbidden	Forbidden	1,2	5	Separate from flammable gases or liquids, oxidizing materials, or organic peroxides
E	Phosphorus, white *or* yellow, in water (*RQ-1/0.454*)	Flammable solid	UN1381	Flammable solid and Poison	None	173.190	Forbidden	25 pounds	1,2	5	Separate from flammable gases or liquids, oxidizing materials, or organic peroxides
	Phosphorus (white or red) and a chlorate, mixtures of	Forbidden									
E	Phosphoryl chloride. *See* Phosphorus oxychloride										
	Photographic film. See Film										
	Photographic flash powder. See Fireworks, special *or* Low explosive										
	Phthalimide derivative pesticide, liquid, n.o.s. (*compounds and preparations*).	Flammable liquid	UN2774	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Phthalimide derivative pesticide, liquid, n.o.s. (*compounds and preparations*).	Poison B	UN2773	Poison	173.345	173.346	1 quart	55 gallons	1,2	1,2	
	Phthalimide derivative pesticide, solid, n.o.s. (*compounds and preparations*).	Poison B	UN2773	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	

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Hazardous Materials Table—Continued

(1)	(2)	(3)	(3A)	(4)	(5) Packaging		(6) Maximum net quantity in one package		(7) Water shipments		
+/E/A/W	Hazardous materials descriptions and proper shipping names	Hazard class	Identification number	Label(s) required (if not excepted)	(a) Exceptions	(b) Specific requirements	(a) Passenger carrying aircraft or railcar	(b) Cargo aircraft only	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Picrate, dry. See High explosive										
	Picrate of ammonia. See High explosive										
	Picric acid, dry. See High explosive										
	Picric acid, wet, with not less than 10% water	Flammable solid	NA1344	Flammable solid	173.192	173.193	1 pound	25 pounds	1	5	Under deck stowage permitted on cargo vessels if wet with more than 30% water. Stow away from heavy metals and their compounds
	Picric acid, wet with not less than 10% water, over 25 pounds. See High explosive										
	Pinane hydroperoxide, *technically pure. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2162								
	Pinane hydroperoxide solution *not over 45% peroxide*	Organic peroxide	UN2162	Organic peroxide	173.153	173.224	1 quart	1 quart	1,2	4	
	Pinene	Flammable liquid	UN2368	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Pine oil	Combustible liquid	UN1272	None	173.118a	None	No limit	No limit	1,2	1,2	
	Pinwheels. *See* Fireworks, common										
	Pivaloyl chloride. *See* Trimethylacetyl chloride										
	Poisonous liquid *or gas*, flammable, n.o.s.	Poison A	NA1953	Poison gas and Flammable gas	None	173.328	Forbidden	Forbidden	1	5	Segregation same as for flammable gas
	Poisonous liquid *or* gas, n.o.s.	Poison A	NA1955	Poison gas	None	173.328	Forbidden	Forbidden	1	5	
	Poisonous liquid, n.o.s. *or* Poison B, liquid, n.o.s.	Poison B	UN2810	Poison	173.345	173.346	1 quart	55 gallons	1,2	1	
	Poisonous solid, corrosive, n.o.s.	Poison B	UN2928	Poison and Corrosive	173.364	173.365	25 pounds	100 pounds	1	4	
	Poisonous solid, n.o.s. *or* Poison B, solid, n.o.s.	Poison B	UN2811	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1	
E	Polychlorinated biphenyls (*RQ-10/4.54*)	ORM-E	UN2315	None	None	173.510	No limit	No limit	1,2	1,2	If stowed under deck, must be stowed in a recoverable location.
	Polymerizable material. See 173.21										
E	Potassium arsenate, solid (*RQ-1000/454*)	Poison B	UN1677	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
E	Potassium arsenite, solid (*RQ-1000/454*)	Poison B	UN1678	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
	Potassium bifluoride solution. *See* Potassium hydrogen fluoride solution										
	Potassium bromate	Oxidizer	UN1484	Oxidizer	173.153	173.154	25 pounds	100 pounds	1,2	1,2	Separate from ammonium compounds. Stow away from powdered metals.

	Potassium carbonyl	Forbidden									
	Potassium chlorate (*potash chlorate*)	Oxidizer	UN1485	Oxidizer	173.153	173.163	25 pounds	100 pounds	1,2	1,2	Separate from ammonium compounds. Stow away from powdered metals.
F	Potassium chromate (*RQ-1000/454*)	ORM-E	NA9142	None	None	173.510	No limit	No limit	1,2	1,2	
E	Potassium cyanide, solid (*RQ-10/4.54*)	Poison B	UN1680	Poison	173.370	173.370	25 pounds	200 pounds	1,2	1,2	Stow away from acids
E	Potassium cyanide solution (*RQ-10/4.54*)	Poison B	UN1680	Poison	173.345	173.352	1 quart	55 gallons	1,2	1,2	Stow away from acids
	Potassium dichloro isocyanurate. See Potassium dichloro-s-triazinetrione										
	Potassium dichloro-s-triazinetrione, *dry (containing more than 39% available chlorine)*	Oxidizer	NA2465	Oxidizer	173.153	173.217	50 pounds	100 pounds	1,2	1,2	
EA	Potassium dichromate (*RQ-1000/454*)	ORM-A	NA1479	None	173.505	173.510	No limit	No limit	1,2	1,2	
A	Potassium fluoride	ORM-B	UN1812	None	173.505	173.510	No limit	No limit			
	Potassium fluoride solution	Corrosive material	UN1812	Corrosive	173.244	173.249	1 quart	5 gallons	1,2	1,2	
E	Potassium hydrate. *See* Potassium hydroxide										
	Potassium hydrogen fluoride solution	Corrosive material	NA1811	Corrosive	173.244	173.249	1 quart	5 gallons	1,2	1,2	
A	Potassium hydrogen sulfate, solid	ORM-B	UN2509	None	173.505	173.800	25 pounds	100 pounds			
E	Potassium hydroxide, dry solid, flake, bead, *or* granular (*RQ-1000/454*)	Corrosive material	UN1813	Corrosive	173.244	173.245b	25 pounds	100 pounds	1,2	1,2	Keep dry. Do not stow with metals or alloys such as brass, copper, tin, zinc, aluminum, solder, or lead
E	Potassium hydroxide, liquid *or* solution (*RQ-1000/454*)	Corrosive material	UN1814	Corrosive	173.244	173.249	1 quart	10 gallons	1,2	1,2	
	Potassium hypochlorite solution. *See* Hypochlorite solutions containing more than 7% available chlorine by weight										
A	Potassium metabisulfite	ORM-B	NA2693	None	173.505	173.510	No limit	No limit			
	Potassium, metal *or* metallic	Flammable solid	UN2257	Flammable solid and Dangerous when wet	None	173.206	Forbidden	25 pounds	1,2	5	Segregation same as for flammable solids labeled Dangerous When Wet
	Potassium, metal liquid alloy	Flammable solid	UN1420	Flammable solid and Dangerous when wet	None	173.202	Forbidden	1 pound	1,2	5	Segregation same as for flammable solids labeled Dangerous When Wet
	Potassium nitrate	Oxidizer	UN1486	Oxidizer	173.153	173.182	25 pounds	100 pounds	1,2	1,2	
E	Potassium nitrate mixed (*fused*) with sodium nitrite. *See* Sodium nitrite mixed (*fused*) with potassium nitrate										
	Potassium nitrite	Oxidizer	UN1488	Oxidizer	173.153	173.154	25 pounds	100 pounds	1,2	1,2	Separate from ammonium compounds and cyanides. Stow away from foodstuffs
	Potassium perchlorate	Oxidizer	UN1489	Oxidizer	173.153	173.219	25 pounds	100 pounds	1,3	1,3	Stow away from powdered metals
E	Potassium permanganate (*RQ-100/45.4*)	Oxidizer	UN1490	Oxidizer	173.153	173.154 173.194	25 pounds	100 pounds	1,2	1,2	Separate from ammonium compounds and hydrogen peroxide
	Potassium peroxide	Oxidizer	UN1491	Oxidizer	None	173.187	Forbidden	100 pounds	1,2	1,2	Keep dry
	Potassium persulfate	Oxidizer	UN1492	Oxidizer	173.153	173.154	50 pounds	200 pounds	1,2	1,2	
	Potassium sulfide	Flammable solid	UN1382	Flammable solid	173.153	173.207	25 pounds	200 pounds	1,2	1,2	Separate from liquid acids, flammable gases or liquids, oxidizing materials or organic peroxides
	Potassium superoxide	Oxidizer	UN2466	Oxidizer	None	173.187	Forbidden	100 pounds	1,2	1,2	Keep dry. Stow away from powdered metals, permanganates and combustible packagings and cargo
	Pressurized product. See Compressed gas, n.o.s.										

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Hazardous Materials Table—Continued

(1)	(2)	(3)	(3A)	(4)	(5) Packaging		(6) Maximum net quantity in one package		(7) Water shipments		
+/E/A/W	Hazardous materials descriptions and proper shipping names	Hazard class	Identification number	Label(s) required (if not excepted)	(a) Exceptions	(b) Specific requirements	(a) Passenger carrying aircraft or railcar	(b) Cargo aircraft only	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Primer. See Cannon primer, Combination primer, *or* Small-arms primer										
	Primer, detonating. See Detonating primers, Class A or Class C explosives										
	Projectile, explosive. See Explosive projectile										
	Projectile, gas, nonexplosive. See Chemical ammunition, nonexplosive (*containing a Poison A, Poison B or irritating material, as appropriate*)										
	Projectile, gas, smoke, or incendiary, with burster or booster with or without detonating fuze. See Explosive projectile										
	Projectile, illuminating, incendiary or smoke, with expelling charge but without bursting charge. See Fireworks, special										
	Projectile, sand-loaded, empty or solid. See 173.55										
	Propane *or* Liquefied petroleum gas. *See* Liquefied petroleum gas										
E	Propargite (*RQ-10/4.54*)	ORM-E	NA2765	None	None	173.510	No limit	No limit	1,2	1,2	
	Propargyl alcohol	Flammable liquid	NA1986	Flammable liquid and Poison	None	173.119	Forbidden	1 quart	1,2	5	
	Propellant explosive	Class A explosive		Explosive A	None	173.64	Forbidden	Forbidden	6	5	
	Propellant explosive in water (*smokeless powder*)	Class B explosive		Explosive B	None	173.93	Forbidden	Forbidden	1,3	5	Magazine stowage authorized
	Propellant explosive in water, unstable, condemned, *or* deteriorated (*smokeless powder*)	Class B explosive		Explosive B	None	173.93	Forbidden	Forbidden	1,3	5	Magazine stowage authorized
	Propellant explosive, liquid	Class B explosive		Explosive B	None	173.93	Forbidden	10 pounds	1,2	5	Magazine stowage authorized
	Propellant explosive, solid	Class B explosive		Explosive B	None	173.93	Forbidden	10 pounds	1,3	5	Magazine stowage authorized
	Propionaldehyde	Flammable liquid	UN1275	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
E	Propionic acid (*RQ-5000/2270*)	Corrosive material	UN1848	Corrosive	173.244	173.245	1 quart	5 gallons	1,2	1,2	Separated by a complete compartment or hold from organic peroxides
E	Propionic acid solution (*RQ-5000/2270*)	Corrosive material	UN1848	Corrosive	173.244	173.245	1 quart	10 gallons	1,2	1,2	Separated by a complete compartment or hold from organic peroxides

E	Propionic anhydride (*RQ-5000/2270*)	Corrosive material	UN2496	Corrosive	173.244	173.245	1 quart	1 quart	1,2	1	Keep dry
	Propionyl peroxide, *not more than 28% in solution. See* Organic peroxide, liquid *or* solution, n.o.s.		UN2132								
	Propionyl peroxide, more than 28% in solution	Forbidden									
	Propyl acetate	Flammable liquid	UN1276	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Propyl alcohol	Flammable liquid	UN1274	Flammable liquid	173.118	173.125	1 quart	10 gallons	1,2	1,2	
	Propylamine	Flammable liquid	UN1277	Flammable liquid	None	173.119	Forbidden	10 gallons	1,3	5	
	Propyl chloride	Flammable liquid	UN1278	Flammable liquid	None	173.119	Forbidden	10 gallons	1,3	5	
	Propylene *or* Liquefied petroleum gas. *See* Liquefied petroleum gas										
	Propylenediamine	Flammable liquid	UN2258	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
E	Propylene dichloride (*RQ-5000/2270*)	Flammable liquid	UN1279	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Propyleneimine, inhibited	Flammable liquid	UN1921	Flammable liquid	None	173.139	Forbidden	5 pints	1,2	1	
E	Propylene oxide (*RQ-5000/2270*)	Flammable liquid	UN1280	Flammable liquid	173.118	173.119	Forbidden	1 gallon	1,3	4	
	Propyl formate	Flammable liquid	UN1281	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Propyl mercaptan	Flammable liquid	UN2704	Flammable liquid	None	173.141	Forbidden	10 gallons	1,2	5	
	Propyl trichlorosilane	Corrosive material	UN1816	Corrosive	None	173.280	Forbidden	10 gallons	1	1	Keep dry
	Prussic acid. See Hydrocyanic acid, as appropriate										
E	Pyrethrins (*RQ-1000/454*)	ORM-E	NA9184	None	None	173.510	No limit	No limit	1,2	1,2	
	Pyridine	Flammable liquid	UN1282	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Pyridine perchlorate	Forbidden									
	Pyrophoric liquid, n.o.s. *or* Pyroforic liquid, n.o.s.	Flammable liquid	UN2845	Flammable liquid	None	173.134	Forbidden	Forbidden	1	5	Shade from radiant heat. Separate from flammable gases or liquids, oxidizing materials, or organic peroxides
	Pyrosulfuryl chloride	Corrosive material	UN1817	Corrosive	173.244	173.247	1 quart	1 quart	1	4	Keep dry. Glass carboys not permitted on passenger vessels
	Pyroxylin plastic, scrap	Flammable solid	NA1325	Flammable solid	None	173.195	Forbidden	Forbidden	1	5	Shade from radiant heat
	Pyroxylin plastic, rods, sheets, rolls *or* tubes	Flammable solid	NA1325	Flammable solid	173.197	173.197	50 pounds	350 pounds	1,3	1	
	Pyrrolidine	Flammable liquid	UN1922	Flammable liquid	173.118	173.119	Forbidden	10 gallons	1,2	1	
	Quebrachitol pentanitrate	Forbidden									
	Quicklime. *See* Calcium oxide										
E	Quinoline (*RQ-1000/454*)	ORM-E	UN2656	None	None	173.510	No limit	No limit	1,2	1,2	
	Radioactive material, articles, manufactured from natural *or* depleted uranium *or* natural thorium	Radioactive material	UN2909	None	173.421-1 173.424	173.421-1 173.424			1,2	1,2	
	Radioactive material, empty packages	Radioactive material	UN2908	Empty	173.427				1,2	1,2	

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Hazardous Materials Table—Continued

(1)	(2)	(3)	(3A)	(4)	(5) Packaging		(6) Maximum net quantity in one package		(7) Water shipments		
+/E/A/W	Hazardous materials descriptions and proper shipping names	Hazard class	Identification number	Label(s) required (if not excepted)	(a) Exceptions	(b) Specific requirements	(a) Passenger carrying aircraft or railcar	(b) Cargo aircraft only	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Radioactive material, fissile, n.o.s	Radioactive material	UN2918	Radioactive	173.453	173.417			1,2	1,2	
	Radioactive material, instruments and articles	Radioactive material	UN2911	None	173.421-1 173.422	173.421-1 173.422			1,2	1,2	
	Radioactive material, limited quantity, n.o.s	Radioactive material	UN2910	None	173.421 173.421-1	173-421 173.421-1			1,2	1,2	
	Radioactive material, low specific activity *or* LSA, n.o.s	Radioactive material	UN2912	Radioactive	173.421 173.422 173.424	173.425			1,2	1,2	
	Radioactive material, n.o.s	Radioactive material	UN2982	Radioactive	173.421 173.422 173.424	173.415 173.416			1,2	1,2	
	Radioactive material, special form, n.o.s	Radioactive material	UN2974	Radioactive	173.421 173.422	173.415 173.416			1,2	1,2	
	Railway Fusee. See Fusee										
	Railway torpedo. *See* Torpedo, railway										
	Refrigerant gas, n.o.s. *or* Dispersant gas n.o.s.	Nonflammable gas	UN1078	Nonflammable gas	173.306	173.304 173.314 173.315	150 pounds	300 pounds	1,2	1,2	
	Refrigerant gas, n.o.s. *or* Dispersant gas n.o.s.	Flammable gas	NA1954	Flammable gas	173.306	173.304 173.314 173.315	Forbidden	300 pounds	1,2	1,2	
	Refrigerating machine	Nonflammable gas	UN2857	Nonflammable gas	173.306 173.307		No limit	No limit	1,3	1,3	
	Refrigerating machine	Flammable gas	NA1954	Flammable gas	173.306		No limit	No limit	1,3	1,3	
	Refrigerating machine	Flammable liquid	NA1993	Flammable liquid	173.130 173.306		No limit	No limit	1,2	1	
	Resin solution (*resin compound, liquid*)	Flammable liquid	UN1866	Flammable liquid	173.118	173.119	1 quart	55 gallons	1,2	1	
E	Resorcinol *(RQ-1000/454)*	ORM-E	UN2876	None	None	173.510	No limit	No limit	1,2	1,2	
	Rifle grenade. See Grenade, hand *or* rifle, explosive										
	Rifle powder. See Propellant explosive *or* Black powder										
	Road asphalt *or* tar, liquid *See* Asphalt, cut back										
	Road asphalt *or* tar (*when heated to or above its flash point*). *See* Asphalt										

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	Rocket ammunition with empty, inert, *or* solid loaded projectile	Class A explosive		Explosive A	None	173.57	Forbidden	Forbidden	6	5	
	Rocket ammunition with empty projectile	Class B explosive		Explosive B	None	173.90	Forbidden	Forbidden	1,3	5	
	Rocket ammunition with explosive projectile	Class A explosive		Explosive A	None	173.57	Forbidden	Forbidden	6	5	
	Rocket ammunition with gas projectile	Class A explosive		Explosive A	None	173.57	Forbidden	Forbidden	6	5	
	Rocket ammunition with illuminating projectile	Class A explosive		Explosive A	None	173.57	Forbidden	Forbidden	6	5	
	Rocket ammunition with incendiary projectile	Class A explosive		Explosive A	None	173.57	Forbidden	Forbidden	6	5	
	Rocket ammunition with inert loaded projectile	Class B explosive		Explosive B	None	173.90	Forbidden	Forbidden	1,3	5	
	Rocket ammunition with smoke projectile	Class A explosive		Explosive A	None	173.57	Forbidden	Forbidden	6	5	
	Rocket ammunition with solid projectile	Class B explosive		Explosive B	None	173.90	Forbidden	Forbidden	1,3	5	
	Rocket body, with electric primer or electric squib. See 173.55										
	Rocket engine, liquid	Class B explosive		Explosive B	None	173.95	Forbidden	Forbidden	1,2	5	Magazine stowage authorized
	Rocket fireworks. See Fireworks, common										
	Rocket head. *See* Explosive projectile										
	Rocket motor	Class A explosive		Explosive A	None	173.79	Forbidden	Forbidden	6	5	
	Rocket motor	Class B explosive		Explosive B	None	173.92	Forbidden	550 pounds	1,3	5	
	Roman candle. See Fireworks, common										
	Rubidium metal	Flammable solid	UN1423	Flammable solid and Dangerous when wet	None	173.206	Forbidden	225 pounds	1,2	5	Segregation same as for flammable solid labeled Dangerous When Wet
	Rubidium metal, in cartridges	Flammable solid	UN1423	Flammable solid and Dangerous when wet	173.206		1 pound	25 pounds	1,2	4	Segregation same as for flammable solid labeled Dangerous When Wet
	Safety fuse. *See* Fuse, safety										
	Safety squib	Class C explosive		Explosive C	None	173.106	50 pounds	150 pounds	1,3	1,3	
	Salute. See Fireworks common *or* special										
	Samples. See 172.101(c)(12)										
	Sand acid. *See* Hydrofluorosilicic acid										
	Selenic acid, liquid	Corrosive material	UN1905	Corrosive	None	173.245	Forbidden	5 pints	1,2	1,2	
	Selenium nitride	Forbidden									
E	Selenium oxide (*RQ-1000/454*)	Poison B	NA2811	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
	Self-lighting cigarette	Flammable solid	UN1867	Flammable solid	173.21		Fobidden	Forbidden	1,2	1,2	Keep dry
	Self propelled vehicle. *See* Motor vehicle										
	Shaped charge, commercial. See High explosive *(173.65(h))*										
	Shaped charges (commercial) containing more than 8 ounces of explosives	Forbidden									
	Shell, fireworks. *See* Fireworks, common *or* special										
	Ship, distress signal. See Fireworks, special										

Hazardous Materials Table—Continued

(1)	(2)	(3)	(3A)	(4)	(5) Packaging		(6) Maximum net quantity in one package		(7) Water shipments		
+/E/A/W	Hazardous materials descriptions and proper shipping names	Hazard class	Identification number	Label(s) required (if not excepted)	(a) Exceptions	(b) Specific requirements	(a) Passenger carrying aircraft or railcar	(b) Cargo aircraft only	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Signal flare	Class C explosive		Explosive C	None	173.108	50 pounds	200 pounds	1,2	1,2	
	Silicofluoric acid. *See* Hydrofluorosilicic acid										
	Silicon chloride *or* Silicon tetrachloride	Corrosive material	UN1818	Corrosive	173.244	173.247	1 quart	1 gallon	1	1	Keep dry. Glass carboys not permitted on passenger vessels
	Silicon chrome, exothermic. *See* Ferrochrome, exothermic										
+	Silicon tetrafluoride	Nonflammable gas	UN1859	Nonflammable gas	173.306	173.302	Forbidden	300 pounds	1	4	Stow away from foodstuffs
	Silver acetylide (dry)	Forbidden									
	Silver azide (dry)	Forbidden									
	Silver chlorite (dry)	Forbidden									
+	Silver cyanide	Poison B	UN1684	Poison	173.370	173.370	25 pounds	200 pounds	1,2	1,2	Stow away from acids
	Silver fulminate (dry)	Forbidden									
E	Silver nitrate (*RQ-1/0.454*)	Oxidizer	UN1493	Oxidizer	173.153	173.182	25 pounds	100 pounds	1,2	1,2	Stow away from foodstuffs
	Silver oxalate (dry)	Forbidden									
	Silver picrate (dry)	Forbidden									
	Small arms ammunition	Class C explosive		None	173.101		50 pounds	150 pounds	1,3	1,3	
	Small arms ammunition	ORM-D		None	173.101	173.1201	65 pounds gross	65 pounds gross			
	Small arms ammunition, irritating (*tear gas*) cartridge	Class C explosive		Irritant	None	173.101	Forbidden	150 pounds	1,3	1,3	
	Small arms primer	Class C explosive		None	None	173.107	50 pounds	150 pounds	1,3	1,3	
	Smoke candle	Class C explosive		Explosive C	None	173.108	50 pounds	200 pounds	1,3	1,3	
	Smoke generator. See Chemical ammunition, nonexplosive (*containing a Poison A, Poison B, or irritating material, as appropriate*)										
	Smoke grenade	Class C explosive		Explosive C	None	173.108	50 pounds	150 pounds	1,3	1,3	
	Smokeless powder for cannon or small arms. See Propellant explosive, *Class A or B, as appropriate*										
	Smokeless powder for small arms (*100 pounds or less*)	Flammable solid	NA1325	Flammable solid	173.[illegible]	173.197a	Forbidden	Forbidden	1,3	1,3	Segregation same as for explosives
	Smoke pot	Class C explosive		Explosive C	None	173.108	50 pounds	200 pounds	1,3	1,3	

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	Smoke projectile with bursting charge. See Explosive projectile										
	Smoke projectile with expelling charge but without bursting charge. See Fireworks, special										
	Smoke signal	Class C explosive		Explosive C	None	173.108	50 pounds	200 pounds	1,3	1,3	
	Soda amatol. See High explosive										
	Soda lime, solid	Corrosive material	UN1907	Corrosive	173.244	173.245b	25 pounds	100 pounds	1,2	1,2	Keep dry
	Sodium acid sulfate, solid *or* solution. *See appropriate* Sodium hydrogen sulfate *entry*										
A	Sodium aluminate, solid	ORM-B	UN2812	None	173.505	173.800	25 pounds	100 pounds			
	Sodium aluminate solution	Corrosive material	UN1819	Corrosive	173.244	173.249	1 quart	5 gallons	1,2	1,2	
	Sodium aluminum hydride	Flammable solid	UN2835	Flammable solid and Dangerous when wet	None	173.206	Forbidden	25 pounds	1,2	5	Segregation same as for flammable solids labeled Dangerous When Wet
	Sodium amide	Flammable solid	UN1425	Flammable solid and Dangerous when wet	None	173.206	Forbidden	25 pounds	1,2	5	Segregation same as for flammable solids labeled Dangerous When Wet
E	Sodium arsenate (*RQ-1000/454*)	Poison B	UN1685	Poison	173.364	173.365 173.368	50 pounds	200 pounds	1,2	1,2	
E	Sodium arsenite, liquid, (*solution*), (*RQ-1000/454*)	Poison B	UN1686	Poison	173.345	173.346	1 quart	55 gallons	1,2	1,2	
*	Sodium azide	Poison B	UN1687	Poison	173.364	173.375	50 pounds	100 pounds	1,2	1,2	Stow away from heavy metals, especially lead and its compounds. Stow separate from acids
E	Sodium bifluoride, solid (*RQ-5000/2270*)	Corrosive material	UN2439	Corrosive	173.244	173.245b	25 pounds	100 pounds	1,2	1,2	
E	Sodium bifluoride, solution (*RQ-5000/2270*)	Corrosive material	UN2439	Corrosive	173.244	173.245	1 quart	5 gallons	1,2	1,2	
	Sodium bisulfate, solid *or* solution. *See* Sodium hydrogen sulfate, solid *or* solution										
E	Sodium bisulfite, solid, *or* solution *See* Sodium hydrogen sulfite, solid*or*solution										
	Sodium bromate	Oxidizer	UN1494	Oxidizer	173.153	173.154	25 pounds	100 pounds	1 2	1,2	Stow separate from ammonium compounds. Stow away from powdered metals
	Sodium chlorate (*soda chlorate*)	Oxidizer	UN1495	Oxidizer	173.153	173.163	25 pounds	100 pounds	1,2	1,2	Stow separate from ammonium compounds. Stow away from powdered metals
	Sodium chlorite	Oxidizer	UN1496	Oxidizer	None	173.160	Forbidden	100 pounds	1,2	1,2	Stow separate from ammonium compounds. Stow away from powdered metals
	Sodium chlorite solution (*not exceeding 42% sodium chlorite*)	Corrosive material	UN1908	Corrosive	173.244	173.263	1 quart	4 gallons	1,2	1	Glass carboys in hampers not permitted under deck
E	Sodium chromate (*RQ-1000/454*)	ORM-E	NA9145	None	None	173.510	No limit	No limit	1,2	1,2	
E	Sodium cyanide, solid (*RQ-10/4.54*)	Poison B	UN1689	Poison	173.370	173.370	25 pounds	200 pounds	1,2	1,2	Stow away from acids
E	Sodium cyanide solution (*RQ-10/4.54*)	Poison B	UN1689	Poison	173.345	173.352	1 quart	55 gallons	1,2	1,2	Stow away from acids
	Sodium dichloroisocyanurate. *See* Sodium dichloro-s-triazinetrione										
	Sodium dichloro-s-triazinetrione (*dry, containing more than 39% available chlorine*)	Oxidizer	UN2465	Oxidizer	173.153	173.217	50 pounds	100 pounds	1,2	1,2	
EA	Sodium dichromate (*RQ-1000/454*)	ORM-A	NA1479	None	173.505	173.510	No limit	No limit	1,2	1,2	

Hazardous Materials Table—Continued

(1)	(2)	(3)	(3A)	(4)	(5) Packaging		(6) Maximum net quantity in one package		(7) Water shipments		
+/E/A/W	Hazardous materials descriptions and proper shipping names	Hazard class	Identification number	Label(s) required (if not excepted)	(a) Exceptions	(b) Specific requirements	(a) Passenger carrying aircraft or railcar	(b) Cargo aircraft only	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
E	Sodium dodecylbenzenesulfonate (*RQ-1000/454*)	ORM-E	NA9146	None	None	173.510	No limit	No limit	1,2	1,2	
EA	Sodium fluoride, solid (*RQ-5000/2270*)	ORM-B	UN1690	None	173.505	173.510	No limit	No limit	1,2	1,2	
E	Sodium fluoride solution (*RQ-5000/2270*)	Corrosive material	UN1690	Corrosive	173.244	173.245	1 quart	5 gallons	1,2	1,2	Stow away from acids
E	Sodium hydrate *See* Sodium hydroxide										
	Sodium hydride	Flammable solid	UN1427	Flammable solid and Dangerous when wet	None	173.198	Forbidden	25 pounds	1,2	5	Segregation same as for flammable solids labeled Dangerous When Wet
A	Sodium hydrogen sulfate, solid	ORM-B	UN1821	None	173.505	173.800	25 pounds	100 pounds			
	Sodium hydrogen sulfate solution	Corrosive material	UN2837	Corrosive	173.244	173.245	1 quart	1 gallon	1,2	1,2	
EA	Sodium hydrogen sulfite, solid (*RQ-5000/2270*)	ORM-B	NA2693	None	173.505	173.800	25 pounds	100 pounds	1,2	1,2	
E	Sodium hydrogen sulfite, solution (*RQ-5000/2270*)	Corrosive material	NA2693	Corrosive	173.244	173.245	1 quart	5 gallons	1,2	1,2	
E	Sodium hydrosulfide, solid(*with less than 25% water of crystallization) (RQ-5000/2270*)	Flammable solid	UN2318	Flammable solid	173.153	173.154	25 pounds	100 pounds	1,2	1,2	
E	Sodium hydrosulfide, solid (*with not less than 25% water of crystalization)(RQ-5000/2270*)	Corrosive material	NA2923	Corrosive	173.244	173.245b	25 pounds	100 pounds	1.2	1,2	
E	Sodium hydrosulfide, solution (*RQ-5000/2270*)	Corrosive material	NA2922	Corrosive	173.244	173.245	1 quart	5 gallons	1,2	1,2	
	Sodium hydrosulfite (*sodium dithionite*)	Flammable solid	UN1384	Flammable solid	173.153	173.204	25 pounds	100 pounds	1,2	1,2	Keep dry. Below deck stowage in metal drums only. Separate from flammable gases, liquids, oxidizing materials, or organic peroxides
E	Sodium hydroxide, dry solid, flake, bead, *or* granular (*RQ-1000/454*)	Corrosive material	UN1823	Corrosive	173.244	173.245b	25 pounds	200 pounds	1,2	1,2	Keep dry
E	Sodium hydroxide, liquid *or* solution (*RQ-1000/454*)	Corrosive material	UN1824	Corrosive	173.244	173.245	1 quart	5 gallons	1,2	1,2	
E	*Sodium hypochlorite. See* Hypochlorite solution *or* Hypochlorite solution containing not more than 7% available chlorine										
A	Sodium metabisulfite	ORM-B	NA2693	None	173.505	173.510	No limit	No limit			
E	Sodium, metal *or* metallic (*RQ-1000/454*)	Flammable solid	UN1428	Flammable solid and Dangerous when wet	None	173.206	Forbidden	25 pounds	1,2	5	Segregation same as for flammable solids labeled Dangerous When Wet

E	Sodium, metal dispersion in organic solvent (*RQ-1000/454*)	Flammable solid	UN1429	Flammable solid and Dangerous when wet	None	173.230.	Forbidden	10 pounds	1,2	5	Segregation same as for flammable solids labeled Dangerous When Wet
E	Sodium, metal liquid alloy (*RQ-1000/454*)	Flammable solid	NA1421	Flammable solid and Dangerous when wet	None	173.202	Forbidden	1 pound	1,2	5	Segregation same as for flammable solids labeled Dangerous When Wet
E	Sodium methylate, alcohol mixture (*RQ-1000/454*)	Combustible liquid	NA1289	None	173.118a	None	No limit	No limit	1,2	1,2	
E	Sodium methylate, alcohol mixture (*RQ-1000/454*)	Flammable liquid	NA1289	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
E	Sodium methylate, alcohol mixture (*RQ-1000/454*)	Corrosive material	NA1289	Corrosive	173.244	173.245	1 quart	1 quart	1,2	1,2	
E	Sodium methylate, dry (*RQ-1000/454*)	Flammable solid	UN1431	Flammable solid and Dangerous when wet	173.153	173.154	25 pounds	100 pounds	1,2	1	
	Sodium monoxide, solid	Corrosive material	UN1825	Corrosive	173.244	173.245b	25 pounds	100 pounds	1,2	1,2	Keep dry
	Sodium nitrate	Oxidizer	UN1498	Oxidizer	173.153	173.182	25 pounds	100 pounds	1,2	1,2	
	Sodium nitrate bags. See Bags, sodium nitrate, empty and unwashed										
E	Sodium nitrite (*RQ-100/45.4*)	Oxidizer	UN1500	Oxidizer	173.153	173.234	25 pounds	100 pounds	1,2	1,2	Stow separate from ammonium compounds and cyanides. Bagged material not permitted on passenger vessels
E	Sodium nitrite mixed (*fused*) with potassium nitrate (*RQ-100/45.4*)	Oxidizer	UN1487	Oxidizer	173.153	173.183	25 pounds	100 pounds	1,2	1,2	Stow separate from ammonium compounds and cyanides
E	Sodium nitrite mixture (*sodium nitrate, sodium nitrite, and potassium nitrate*) (*RQ-100/45.4*)	Oxidizer	NA1487	Oxidizer	173.153	173.234	25 pounds	100 pounds	1,2	1,2	Stow separate from ammonium compounds and cyanides
A	Sodium pentachlorophenate	ORM-A	UN2567	None	173.505	173.510	No limit	No limit			
	Sodium perchlorate	Oxidizer	UN1502	Oxidizer	173.153	173.154	25 pounds	100 pounds	1,3	1,3	Stow away from powdered metals
	Sodium permanganate	Oxidizer	UN1503	Oxidizer	173.153	173.154	25 pounds	100 pounds	1,2	1,2	Separate from ammonium compounds and hydrogen peroxide
	Sodium peroxide	Oxidizer	UN1504	Oxidizer	None	173.187	Forbidden	100 pounds	1,2	1	Keep dry. Stow away from powdered metals, permanganates, combustible packing of other cargo, and combustible foodstuffs
	Sodium persulfate	Oxidizer	UN1505	Oxidizer	173.153	173.154	50 pounds	200 pounds	1,2	1,2	
	Sodium phenolate, solid	Corrosive material	UN2497	Corrosive	173.244	173.245b	25 pounds	100 pounds	1,2	1,2	
E	Sodium phosphate, dibasic (*RQ-5000/2270*)	ORM-E	NA9147	None	None	173.510	No limit	No limit	1,2	1,2	
E	Sodium phosphate, tribasic (*RQ-5000/2270*)	ORM-E	NA9148	None	None	173.510	No limit	No limit	1,2	1,2	
	Sodium phosphide	Flammable solid	UN1432	Flammable solid and Dangerous when wet	None	173.154	Forbidden	25 pounds	1	5	
	Sodium picramate, wet (*with at least 20% water*)	Flammable solid	UN1349	Flammable solid	None	173.205	Forbidden	25 pounds	1,2	5	Stow away from heavy metals, especially lead, and its compounds
	Sodium picryl peroxide	Forbidden									
E	Sodium potassium alloy (liquid)(*RQ-1000/454*)	Flammable solid	UN1422	Flammable solid and Dangerous when wet	None	173.202	Forbidden	1 pound	1,2	5	Under deck stowage must be readily accessible. Segregation same as for flammable solid labeled Dangerous When Wet.

Hazardous Materials Table—Continued

(1)	(2)	(3)	(3A)	(4)	(5) Packaging		(6) Maximum net quantity in one package		(7) Water shipments		
+ E/ A/ W	Hazardous materials descriptions and proper shipping names	Hazard class	Identification number	Label(s) required (if not excepted)	(a) Exceptions	(b) Specific requirements	(a) Passenger carrying aircraft or railcar	(b) Cargo aircraft only	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
E	Sodium potassium alloy (solid)(*RQ-1000/454*)	Flammable solid	UN1422	Flammable solid and Dangerous when wet	None	173.206	Forbidden	25 pounds	1,2	5	Under deck stowage must be readily accessible. Segregation same as for flammable solids labeled Dangerous When Wet
E	Sodium selenite (*RQ-1000/454*)	Poison B	UN2630	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
	Sodium sulfide, anhydrous *or* Sodium sulfide *with less than 30% water of crystallization*	Flammable solid	UN1385	Flammable solid	173.153	173.207	25 pounds	100 pounds	1,2	1,2	Stow separated from liquid acids
	Sodium sulfide, hydrated *with not less than 30% water*	Corrosive material	UN1849	Corrosive	173.244	173.245b	25 pounds	100 pounds	1,2	1,2	Stow away from acids
	Sodium superoxide	Oxidizer	UN2547	Oxidizer	None	173.187	Forbidden	100 pounds	1,2	5	Keep dry. Stow away from powdered metals, permanganates and combustible packagings and cargo
	Sodium tetranitride	Forbidden									
	Sparklers. See Fireworks, common										
	Spent iron mass. See Iron mass, spent										
	Spent iron sponge. See Iron sponge, spent										
	Spent mixed acid. See Nitrating acid, spent										
	Spent sulfuric acid. See Sulfuric acid, spent										
	Spirits of nitroglycerin, (*1 to 10%*)	Flammable liquid	NA1204	Flammable liquid	None	173.133	Forbidden	6 quarts	1,2	5	Segregation same as for explosives
	Spirits of nitroglycerin, not exceeding 1% nitroglycerin by weight	Flammable liquid	NA1204	Flammable liquid	173.118	173.133	1 quart	6 quarts	1,2	1	
	Sporting powder. See Black powder *or* Propellant explosive, solid										
	Spray starting fluid. See Engine starting fluid										
	Spreader cartridge. See Fireworks, special										
	Squib, electric or safety. See Electric squib *or* Safety squib										
	Stannic phosphide	Flammable solid	UN1433	Flammable solid and Dangerous when wet	None	173.154	Forbidden	25 pounds	1	5	Segregation same as for flammable solid labeled Dangerous When Wet
A	Stannous chloride, solid	ORM-B	NA1759	None	173.505	173.510	No limit	No limit			
	Starter cartridge	Class B explosive		Explosive B	None	173.92	Forbidden	200 pounds	1,3	5	
	Starter cartridge	Class C explosive		Explosive C	None	173.102	50 pounds	150 pounds	1,3	1,3	
	Storage battery, wet. See Battery, electric storage, wet										
	Strontium arsenite, solid	Poison B	UN1691	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	

	Strontium chlorate	Oxidizer	UN1506	Oxidizer	173.153	173.163	25 pounds	100 pounds	1,2	1,2	Stow separate from ammonium compounds. Stow away from powdered metals
	Strontium chlorate, wet	Oxidizer	UN1506	Oxidizer	173.153	173.163	25 pounds	200 pounds	1,2	1,2	Stow separate from ammonium compounds. Stow away from powdered metals
E	Strontium chromate (*RQ-1000/454*)	ORM-E	NA9149	None	None	173.510	No limit	No limit	1,2	1,2	
	Strontium nitrate	Oxidizer	UN1507	Oxidizer	173.153	173.182	25 pounds	100 pounds	1,2	1,2	
	Strontium peroxide	Oxidizer	UN1509	Oxidizer	173.153	173.154	25 pounds	100 pounds	1,2	1,2	Keep dry
	Strychnine salt, solid	Poison B	UN1692	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
E	Strychnine, solid(*RQ-10/4.54*)	Poison B	UN1692	Poison	173.364	173.365	Forbidden	200 pounds	1,2	1,2	
	Styphnate of lead. See Initiating explosive										
E	Styrene monomer, inhibited (*RQ-1000/454*)	Flammable liquid	UN2055	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1,2	
	Substituted nitrophenol pesticide, liquid, n.o.s. (*compounds and preparations*).	Flammable liquid	UN2780	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Substituted nitrophenol pesticide, liquid, n.o.s. (*compounds and preparations*).	Poison B	UN2779	Poison	173.345	173.346	1 quart	55 gallons	1,2	1,2	
	Substituted nitrophenol pesticide, solid, n.o.s. (*compounds and preparations*).	Poison B	UN2779	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
	Succinic acid peroxide	Organic peroxide	UN2135	Organic peroxide	173.153	173.157 173.158	Forbidden	25 pounds	1	1	
	Succinic acid peroxide, *technically pure. See* Succinic acid peroxide		UN2135								
	Sucrose octanitrate (dry)	Forbidden									
	Sulfur and chlorate, loose mixtures of	Forbidden									
	Sulfur chloride (*di*)	Corrosive material	UN1828	Corrosive	None	173.247	Forbidden	1 gallon	1	1	Keep dry. Glass carboys not permitted on passenger vessels
E	Sulfur chloride (*mono*) (*RQ-1000/454*)	Corrosive material	UN1828	Corrosive	None	173.247	Forbidden	1 gallon	1	1	Keep dry. Glass carboys not permitted on passenger vessels
	Sulfur dioxide	Nonflammable gas	UN1079	Nonflammable gas	173.306	173.304 173.314 173.315	Forbidden	300 pounds	1,2	4	Stow away from living quarters
	Sulfur flower. *See* Sulfur, solid										
	Sulfur hexafluoride	Nonflammable gas	UN1080	Nonflammable gas	173.306	173.304	150 pounds	300 pounds	1,2	1,2	
E	Sulfuric acid (*For fuming sulfuric acid, see* Oleum) (*RQ-1000/454*)	Corrosive material	UN1830	Corrosive	173.244	173.272	1 quart	1 gallon	1	1	Keep dry. Under deck stowage is permitted on cargo vessels only in metal drums
E	Sulfuric acid, spent (*RQ-1000/454*)	Corrosive material	UN1832	Corrosive	None	173.248	Forbidden	1 quart	1	1	Under deck stowage is permitted on cargo vessels only in metal drums
	Sulfuric anhydride. *See* Sulfur trioxide										
	Sulfurous acid	Corrosive material	UN1833	Corrosive	173.244	173.245	2 gallons	2 gallons	1,2	1	Glass carboys in hampers not permitted under deck
W	Sulfur, solid	ORM-C	UN1350	None	173.505	173.1080			1,2	1,2	Protect from sparks and open flame. Stow separate from oxidizing materials. Segregation same as for flammable solids
	Sulfur trioxide	Corrosive material	UN1829	Corrosive	173.244	173.273	Forbidden	1 gallon	1,2	1,2	Keep dry. Glass bottles not permitted under deck
	Sulfuryl chloride	Corrosive material	UN1834	Corrosive	173.244	173.247	1 quart	1 quart	1	1	Keep dry. Glass carboys not permitted on passenger vessels
	Sulfuryl fluoride	Nonflammable gas	UN2191	Nonflammable gas	173.306	173.304 173.314	150 pounds	300 pounds	1,3	1	
	Sulphur. *See* Sulfur, solid										
	Supplementary charge (explosive)	Class A explosive		Explosive A	None	173.69	Forbidden	Forbidden	6	5	
EA	2,4,5-T. *See* 2,4,5-Trichlorophenoxyacetic acid										

Hazardous Materials Table—Continued

(1)	(2)	(3)	(3A)	(4)	(5)		(6)		(7)		
					Packaging		Maximum net quantity in one package		Water shipments		
+/E/A/W	Hazardous materials descriptions and proper shipping names	Hazard class	Identification number	Label(s) required (if not excepted)	(a) Exceptions	(b) Specific requirements	(a) Passenger carrying aircraft or railcar	(b) Cargo aircraft only	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
E	2,4,5-T amine, ester, *or* salt. *See* 2,4,5-Trichlorophenoxyacetic acid, amine, ester, *or* salt										
	Tank car, containing residual phosphorus and filled with water or inert gas. See 173.190										
	Tank car, empty (previously used for a hazardous material). See 173.29										
	Tank car, empty (previously used for a Poison A material). See 172.510 and 173.29										
	Tank, portable, empty (previously used for a hazardous material). See 172.510, 172.514 and 173.29										
	Tank truck, empty. See 172.510, 172.514 and 173.29										
EA	TDE (*1,1-Dichloro-2,2-bis(p-chlorophenyl) ethane*) (*RQ-1/0.454*)	ORM-A	NA2761	None	173.505	173.510	50 pounds	No limit	1,2	1,2	
	Tear gas ammunition. See Chemical ammunition, nonexplosive *(containing an irritant material)*										
	Tear gas candle	Irritating material	UN1700	Irritant	None	173.385	Forbidden	75 pounds	1	5	Stow away from living quarters
	Tear gas cartridge. See Small arms ammunition, irritating (*tear gas*) cartridge										
	Tear gas device	Irritating material	NA1693	Irritant	None	173.385	Forbidden	75 pounds	1	5	Stow away from living quarters
	Tear gas grenade. See Grenade, tear gas										
	Tertiary alcohol. See Alcohol, n.o.s										
	Tetraazido benzene quinone	Forbidden									
AW	Tetrachloroethane	ORM-A	UN1702	None	173.505	173.620	1 quart	10 gallons	1,2	1,2	
A	Tetrachloroethylene *or* Perchloroethylene	ORM-A	UN1897	None	173.505	173.605	10 gallons	55 gallons			
	Tetraethylammonium perchlorate (dry)	Forbidden									
	Tetraethyl dithiopyrophosphate and compressed gas mixture	Poison A	UN1703	Poison gas	None	173.334	Forbidden	Forbidden	1	5	Shade from radiant heat. Stow away from living quarters. Segregation same as for nonflammable gases
	Tetraethyl dithiopyrophosphate, liquid	Poison B	UN1704	Poison	None	173.358	Forbidden	1 quart	1	5	
	Tetraethyl dithiopyrophosphate mixture, dry	Poison B	UN1704	Poison	None	173.377	Forbidden	200 pounds	1	5	
	Tetraethyl dithiopyrophosphate mixture, liquid	Poison B	UN1704	Poison	None	173.359	Forbidden	1 quart	1	5	

E	Tetraethyl lead, liquid (*including flash point for export shipment by water*) (*RQ-100/45.4*)	Poison B	NA1649	Poison	None	173.354	Forbidden	55 gallons	1	5	If flash point is 141 deg F. or less, segregation must be the same as for flammable liquids
E	Tetraethyl pyrophosphate and compressed gas mixture (*RQ-100/45.4*)	Poison A	UN1705	Poison gas	None	173.334	Forbidden	Forbidden	1	5	Shade from radiant heat. Stow away from living quarters. Segregation same as for nonflammable gases
E	Tetraethyl pyrophosphate, liquid (*RQ-100/45.4*)	Poison B	NA2783	Poison	None	173.358	Forbidden	1 quart	1,2	5	
E	Tetraethyl pyrophosphate mixture, dry (*RQ-100/45.4*)	Poison B	NA2783	Poison	None	173.377	Forbidden	200 pounds	1,2	5	
E	Tetraethyl pyrophosphate mixture, liquid (*RQ-100/45.4*)	Poison B	NA2783	Poison	None	173.359	Forbidden	1 quart	1,2	5	
+	Tetrafluoroethylene, inhibited	Flammable gas	UN1081	Flammable gas	173.306	173.304	Forbidden	300 pounds	1,2	1,2	Stow away from living quarters
	1,2,3,6-Tetrahydrobenzaldehyde	Corrosive material	UN2498	Corrosive	173.244	173.245	1 quart	10 gallons	1,2	1,2	
	Tetrahydrofuran	Flammable liquid	UN2056	Flammable liquid	None	173.119	Forbidden	10 gallons	1,3	5	
	Tetralin hydroperoxide, *technically pure*. *See* Organic peroxide, solid, n.o.s.		UN2136								
	Tetramethylammonium hydroxide, liquid	Corrosive material	UN1835	Corrosive	173.244	173.245	1 quart	10 gallons	1,2	1,2	
	1,1,3,3-Tetramethylbutyl hydroperoxide, *technically pure*. *See* Organic peroxide, liquid *or* solution, n.o.s.		UN2160								
	1,1,3,3-Tetramethylbutyl peroxy-2-ethylhexanoate, *technically pure*. *See* Organic peroxide, liquid *or* solution, n.o.s.		UN2161								
	Tetramethylene diperoxide dicarbamide	Forbidden									
A	Tetramethylmethylenediamine	ORM-A	NA9069	None	173.505	173.510	No limit	No limit			
	Tetranitro diglycerin	Forbidden									
	Tetranitromethane	Oxidizer	UN1510	Oxidizer	None	173.203	Forbidden	Forbidden	1	5	Shade from radiant heat. Stow away from foodstuffs
	2,3,4,6-Tetranitrophenol	Forbidden									
	2,3,4,6-Tetranitrophenyl methyl nitramine	Forbidden									
	2,3,4,6-Tetranitrophenylnitramine	Forbidden									
	Tetranitroresorcinol (dry)	Forbidden									
	2,3,5,6-Tetranitroso-1,4-dinitrobenzene	Forbidden									
	2,3,5,6-Tetranitroso nitrobenzene (dry)	Forbidden									
	Tetrazene (guanyl nitrosamino guanyltetrazene). *See* Initiating explosive										
	Tetrazine (dry)	Forbidden									
	Tetrazolyl azide (dry)	Forbidden									
	Tetryl. *See* High explosive										
	Textile treating compound *or* mixture, liquid	Corrosive material	NA1760	Corrosive		173.249a	1 quart	10 gallons	1,2	1,2	
	Thallium salt, solid, n.o.s.	Poison B	NA1707	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
E	Thallium sulfate, solid (*RQ-1000/454*)	Poison B	NA1707	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
	Thinner for rust preventive coating. *See* Rust preventive coating										
	Thiocarbonylchloride. *See* Thiophosgene										
	Thioglycolic acid	Corrosive material	UN1940	Corrosive	173.244	173.245	1 quart	1 gallon	1,2	1,2	Glass carboys in hampers not permitted under deck
	Thionyl chloride	Corrosive material	UN1836	Corrosive	None	173.247	Forbidden	1 gallon	1	1	Keep dry. Glass carboys not permitted on passenger vessels
	Thiophenol. *See* Phenyl mercaptan										

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Hazardous Materials Table—Continued

(1)	(2)	(3)	(3A)	(4)	(5)		(6)		(7)		
					Packaging		Maximum net quantity in one package		Water shipments		
+ E A W	Hazardous materials descriptions and proper shipping names	Hazard class	Identification number	Label(s) required (if not excepted)	(a) Exceptions	(b) Specific requirements	(a) Passenger carrying aircraft or railcar	(b) Cargo aircraft only	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
+	Thiophosgene	Poison B	UN2474	Poison	None	173.356	Forbidden	1 gallon	1	5	Shade from radiant heat
	Thiophosphoryl chloride	Corrosive material	UN1837	Corrosive	None	173.271	Forbidden	1 quart	1	1	Keep dry. Glass carboys not permitted on passenger vessels
A	Thiram	ORM-A	NA2771	None	173.505	173.510	No limit	No limit			
	Thorium metal, pyrophoric	Radioactive material	UN2975	Radioactive and Flammable Solid	None	173.418	Forbidden	Forbidden	1,2	1,2	
	Thorium nitrate	Radioactive material	UN2976	Radioactive and Oxidizer	None	173.419	Forbidden	25 pounds	1,2	1,2	Separate longitudinally by a complete hold or compartment from explosives
	Time fuze. See Fuze, time										
	Tin chloride, fuming. *See* Tin tetrachloride, anhydrous										
	Tin perchloride. *See* Tin tetrachloride, anhydrous										
	Tin tetrachloride, anhydrous	Corrosive material	UN1827	Corrosive	173.244	173.247	1 quart	1 quart	1	1	Keep dry. Glass carboys not permitted on passenger vessels
	Titanium metal powder, dry *or* wet *with less than 20% water*	Flammable solid	UN2546	Flammable solid	None	173.209	Forbidden	75 pounds	1,2	5	
	Titanium metal powder, wet with 20% or more water	Flammable solid	UN1352	Flammable solid	None	173.208	Forbidden	150 pounds	1,2	5	
E	Titanium sulfate solution *containing not more than 45% sulfuric acid(RQ-1000/454)*	Corrosive material	NA1760	Corrosive	173.244	173.297	1 quart	1 gallon	1	4	Shade from radiant heat. Keep dry
	Titanium tetrachloride	Corrosive material	UN1838	Corrosive	173.244	173.247	1 quart	10 gallons	1	1	Keep dry. Glass carboys not permitted on passenger vessels
E	Toluene (*toluol*) (*RQ-1000/454*)	Flammable liquid	UN1294	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
A	Toluenediamine	ORM-A	NA1709	None	173.505	173.510	No limit	No limit			
+	Toluene diisocyanate	Poison B	UN2078	Poison	173.345	173.346	Forbidden	55 gallons	1,3	1,3	Shade from radiant heat
	Toluene sulfonic acid, liquid	Corrosive material	UN2584	Corrosive	173.244	173.245	1 quart	10 gallons	1,2	1,2	
	Torch. See Fireworks, common										
	Torpedo, railway	Class B explosive		Explosive B	None	173.91	Forbidden	200 pounds	1,2	1,2	Passenger vessels in metal lockers only
EA	Toxaphene (*RQ-1/0.454*)	ORM-A	NA2761	None	173.505	173.510	25 pounds	100 pounds	1,2	1,2	
	Toy caps	Class C explosive		Explosive C	None	173.100 173.109	50 pounds	150 pounds	1,3	1,3	
	Toy propellant device	Class C explosive		Explosive C	None	173.111	50 pounds	150 pounds	1,3	1,3	

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	Toy smoke device	Class C explosive		Explosive C	None	173.111	50 pounds	150 pounds	1,3	1,3	
	Toy torpedo. *See* Fireworks, special										
E	2,4,5-TP. *See* 2,4,5-Trichlorophenoxypropionic acid										
E	2,4,5-TP ester. *See* 2,4,5-Trichlorophenoxypropionic acid ester										
	Tracer	Class C explosive		Explosive C	None	173.105	50 pounds	150 pounds	1,3	1,3	
	Tracer fuze	Class C explosive		Explosive C	None	173.105	50 pounds	150 pounds	1,3	1,3	
	Tractor. *See* Motor vehicle										
	Trailer *or* truck body with refrigeration *or* heating equipment. *See* Motor vehicle										
	Triazine pesticide, liquid, n.o.s. (*compounds and preparations*),	Flammable liquid	UN2764	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
	Triazine pesticide, liquid, n.o.s. (*compounds and preparations*), liquid	Poison B	UN2763	Poison	173.345	173.346	1 quart	55 gallons	1,2	1,2	
	Triazine pesticide, solid, n.o.s. (*compounds and preparations*),	Poison B	UN2763	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
	Tri-(b-nitroxyethyl)ammonium nitrate	Forbidden									
EA	Trichlorfon (*RQ-1000/454*)	ORM-A	NA2783	None	173.505	173.510	50 pounds	200 pounds	1,2	1,2	
	Trichloroacetic acid, solid	Corrosive material	UN1839	Corrosive	173.244	173.245b	25 pounds	100 pounds	1,2	1	
	Trichloroacetic acid solution	Corrosive material	UN2564	Corrosive	173.244	173.245	1 quart	1 quart	1,2	1,2	Glass carboys in hampers not permitted under deck
A	1,1,1-Trichloroethane	ORM-A	UN2831	None	173.505	173.605	10 gallons	55 gallons			
EA	Trichloroethylene (*RQ-1000/454*)	ORM-A	UN1710	None	173.505	173.605	10 gallons	55 gallons	1,2	1,2	
	Trichloroisocyanuric acid, dry	Oxidizer	UN2468	Oxidizer	173.153	173.217	10 pounds	50 pounds	1,2	1,2	Shade from radiant heat. Keep dry, stow separated from nitrogen compounds
	Trichloromethyl perchlorate	Forbidden									
EA	Trichlorophenol (*RQ-10/4.54*)	ORM-A	NA2020	None	173.505	173.510	100 pounds	No limit	1,2	1,2	
EA	2,4,5-Trichlorophenoxyacetic acid (*RQ-100/45.4*)	ORM-A	NA2765	None	173.505	173.510	50 pounds	No limit	1,2	1,2	
E	2,4,5-Trichlorophenoxyacetic acid amine, ester, *or* salt (*RQ-100/45.4*)	ORM-E	NA2765	None	None	173.510	No limit	No limit	1,2	1,2	
EA	2,4,5-Trichlorophenoxypropionic acid (*RQ-100/45.4*)	ORM-A	NA2765	None	173.505	173.510	50 pounds	No limit	1,2	1,2	
E	2,4,5-Trichlorophenoxypropionic acid ester (*RQ-100/45.4*)	ORM-E	NA2765	None	None	173.510	No limit	No limit	1,2	1,2	
	Trichlorosilane	Flammable liquid	UN1295	Flammable liquid	None	173.136	Forbidden	10 gallons	1	5	Segregation same as for flammable solids labeled Dangerous When Wet
	Trichloro-s-triazinetrione dry, *containing over 39% available chlorine*	Oxidizer	NA2468	Oxidizer	173.153	173.217	50 pounds	100 pounds	1,2	1,2	Shade from radiant heat. Keep dry. Stow separated from nitrogen compounds
	(mono-(Trichloro) tetra-(monopotassium dichloro)-penta-s-triazinetrione, dry (*containing over 39% available chlorine*)	Oxidizer	NA2468	Oxidizer	173.153	173.217	50 pounds	100 pounds	1,3	1,3	Keep dry
	Trick matches	Class C explosive		Explosive C	None	173.111	Forbidden	Forbidden	1,3	1,3	
	Trick noise maker, explosive	Class C explosive		Explosive C	None	173.111	50 pounds	150 pounds	1,3	1,3	
E	Triethanolamine dodecylbenzenesulfonate (*RQ-1000/454*)	ORM-E	NA9151	None	None	173.510	No limit	No limit	1,2	1,2	
E	Triethylamine (*RQ-5000/2270*)	Flammable liquid	UN1296	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
+	Trifluorochloroethylene	Flammable gas	UN1082	Flammable gas	173.306	173.304 173.314	Forbidden	10 gallons	1,2	1	

Hazardous Materials Table—Continued

(1)	(2)	(3)	(3A)	(4)	(5) Packaging		(6) Maximum net quantity in one package		(7) Water shipments		
+/ E/ A/ W	Hazardous materials descriptions and proper shipping names	Hazard class	Identification number	Label(s) required (if not excepted)	(a) Exceptions	(b) Specific requirements	(a) Passenger carrying aircraft or railcar	(b) Cargo aircraft only	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Trifluoromethane and chlorotrifluoromethane mixture (*constant boiling mixture*) (*R-503*). *See* Refrigerant gas, n.o.s.										
	Triformoxime trinitrate	Forbidden									
	1,3,5-Trimethyl-2,4,6-trinitrobenzene	Forbidden									
	Trimethylacetyl chloride	Corrosive material	UN2438	Corrosive	173.244	173.247	1 quart	1 quart	1,2	1,2	
E	Trimethylamine, anhydrous (*RQ-1000/454*)	Flammable gas	UN1083	Flammable gas	173.306	173.304 173.314 173.315	Forbidden	300 pounds	1	4	
E	Trimethylamine, aqueous solution (*RQ-1000/454*)	Flammable liquid	UN1297	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	Stow away from mercury and mercury compounds
	Trimethylchlorosilane	Flammable liquid	UN1298	Flammable liquid	None	173.135	Forbidden	10 gallons	1,2	1	
	Trimethylene glycol diperchlorate	Forbidden									
	Trimethylol nitromethane trinitrate	Forbidden									
	2,4,6-Trinitro-1,3,5-triazido benzene (dry)	Forbidden									
	2,4,6-Trinitro-1,3-diazobenzene	Forbidden									
	Trinitroacetic acid	Forbidden									
	Trinitroacetonitrile	Forbidden									
	Trinitroamine cobalt	Forbidden									
	Trinitrobenzene, dry. See High explosive										
	Trinitrobenzene, wet *containing at least 10% water*	Flammable solid	UN1354	Flammable solid	173.212		1 pound	1 pound	1	4	Stow away from heavy metals and their compounds
	Trinitrobenzene, wet, containing at least 10% water, over 16 ounces in one outside packaging. See High explosive										
	Trinitrobenzoic acid, dry. See High explosive										
	Trinitrobenzoic acid, wet, *containing at least 10% water*	Flammable solid	UN1355	Flammable solid	173.192	175.193	1 pound	25 pounds	1	5	Stow away from heavy metals and their compounds
	Trinitrobenzoic acid, wet, containing at least 10% water, over 25 pounds in one outside packaging. See High explosives										
	Trinitroethanol	Forbidden									
	Trinitroethylnitrate	Forbidden									
	Trinitromethane	Forbidden									
	1,3,5-Trinitronaphthalene	Forbidden									
	2,4,6-Trinitrophenyl guanidine (dry)	Forbidden									
	2,4,6-Trinitrophenyl nitramine	Forbidden									

	2,4,6-Trinitrophenyl trimethylol methyl nitramine trinitrate (dry)	Forbidden									
	Trinitroresorcinol. See High explosive										
	2,4,6-Trinitroso-3-methyl nitraminoanisole	Forbidden									
	Trinitrotetramine cobalt nitrate	Forbidden									
	Trinitrotoluene, dry. See High explosive										
	Trinitrotoluene, wet *containing at least 10% water*	Flammable solid	UN1356	Flammable solid	173.212		1 pound	1 pound	1	4	Stow away from heavy metals and their compounds
	Trinitrotoluene, wet, containing at least 10% water, over 16 ounces in one outside packaging. See High explosive										
	Tris-(1-aziridinyl) phosphine oxide	Corrosive material	UN2501	Corrosive	173.244	173.299a	1 quart	1 gallon	1	1	Keep dry. Glass carboys not permitted on passenger vessels
	Tris, bis-bifluoroamino diethoxy propane (TVOPA)	Forbidden									
	Tungsten hexafluoride	Corrosive material	UN2196	Corrosive	None	173.284	Forbidden	110 pounds	1	5	Segregation same as for nonflammable gases
	Turpentine	Combustible liquid	UN1299	None	173.118a	None	No limit	No limit	1,2	1,2	
	Turpentine	Flammable liquid	UN1299	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1,2	
	Uranium hexafluoride, fissile *(containing more than 1% U-235)*	Radioactive material	UN2977	Radioactive and Corrosive	173.453	173.417			1,2	1,2	
	Uranium hexafluoride, low specific activity	Radioactive material	UN2978	Radioactive and Corrosive	173.421	173.425			1,2	1,2	
	Uranium metal pyrophoric	Radioactive material	UN2979	Radioactive and Flammable solid	None	173.418	Forbidden	Forbidden	1,2	1,2	
E	Uranyl acetate *(RQ-5000/2270)*	Radioactive material	NA9180	Radioactive	173.421 173.425	173.415 173.416			1,2	1,2	
E	Uranyl nitrate hexahydrate solution *(RQ-5000/2270)*	Radioactive material	UN2980	Radiontive and Corrosive	173.421 173.425	173.415 173.416 173.417			1,2	1,2	
E	Uranyl nitrate, solid *(RQ-5000/2270)*	Radioactive material	UN2981	Radioactive and Oxidizer	None	173.419	Forbidden	25 pounds	1,2	1,2	Separate rate longitudinally by an intervening hold or compartment from explosives
	Urea nitrate, dry. See High explosive										
	Urea nitrate, wet *with 10% or more water*	Flammable solid	UN1357	Flammable solid	173.192	173.193	1 pound	25 pounds	1,2	1,2	
	Urea nitrate, wet with 10% or more water, over 25 pounds in one outside packaging. See High explosive										
	Urea peroxide	Organic peroxide	NA1511	Organic peroxide	173.153	173.227	2 pounds	25 pounds	1	4	Keep dry. Shade from radiant heat
	Valeric acid	Corrosive material	NA1760	Corrosive	173.244	173.245	1 quart	10 gallons	1,2	1,2	
	Valeryl chloride	Corrosive material	UN2502	Corrosive	173.244	173.245	1 quart	1 gallon	1,2	1,2	
	Vanadium oxytrichloride	Corrosive material	UN2443	Corrosive	173.244	173.247a	Forbidden	1 quart	1	4	Shade from radiant heat
	Vanadium oxytrichloride and titanium tetrachloride mixture	Corrosive material	NA2443	Corrosive	None	173.245 173.245a	Forbidden	1 quart	1	4	Shade from radiant heat
E	Vanadium pentoxide (*RQ-1000/454*)	ORM-E	UN2862	None	None	173.510	No limit	No limit	1,2	1,2	

Hazardous Materials Table—Continued

(1)	(2)	(3)	(3A)	(4)	(5) Packaging		(6) Maximum net quantity in one package		(7) Water shipments		
+/E/A/W	Hazardous materials descriptions and proper shipping names	Hazard class	Identification number	Label(s) required (if not excepted)	(a) Exceptions	(b) Specific requirements	(a) Passenger carrying aircraft or railcar	(b) Cargo aircraft only	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Vanadium tetrachloride	Corrosive material	UN2444	Corrosive	173.244	173.247a	Forbidden	1 quart	1	4	Shade from radiant heat
E	Vanadyl sulfate (*RQ-1000/454*)	ORM-E	NA9152	None	None	173.510	No limit	No limit	1,2	1,2	
	Very signal cartridge	Class C explosive		Explosive C	None	173.108	50 pounds	200 pounds	1,3	1,3	
E	Vinyl acetate (*RQ-1000/454*)	Flammable liquid	UN1301	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
+	Vinyl chloride	Flammable gas	UN1086	Flammable gas	173.306	173.304 173.314 173.315	Forbidden	300 pounds	1,2	4	Stow away from living quarters
	Vinyl ethyl ether, inhibited	Flammable liquid	UN1302	Flammable liquid	None	173.119	Forbidden	1 gallon	1,3	5	
	Vinyl fluoride, inhibited	Flammable gas	UN1860	Flammable gas	173.306	173.204 173.314 173.315	Forbidden	300 pounds	1	4	
E	Vinylidene chloride, inhibited (*RQ-5000/2270*)	Flammable liquid	UN1303	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,3	4	
	Vinyl isobutyl ether	Flammable liquid	UN1304	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1	
+	Vinyl methyl ether	Flammable gas	UN1087	Flammable gas	173.306	173.304 173.314	Forbidden	20 pounds	1,2	1	Stow away from living quarters
	Vinyl nitrate polymer	Forbidden									
	Vinyl trichlorosilane	Flammable liquid	UN1305	Flammable liquid	None	173.135	Forbidden	10 gallons	1,2	1	
	Vitriol, oil of. See Sulfuric acid										
	War head. See Explosive projectile										
	Waste, hazardous. See Hazardous waste, liquid *or* solid, n.o.s.										
	Water pump system *tank charged with compressed air or nitrogen*	Nonflammable gas	NA1956	None	173.306		Forbidden	Forbidden	1,2	1,2	
	Water reactive solid, n.o.s.	Flammable solid	UN2813	Flammable solid and Dangerous when wet	173.153	173.154	Forbidden	25 pounds	1,2	4	Segregation same as for flammable solids labeled Dangerous When Wet
	Wheelchair, battery equipped. See Battery, *electric storage,* wet, with wheelchair										
E	White acid (*ammonium bifluoride and hydrofluoric acid mixture*) (*RQ-5000/2270*)	Corrosive material	NA1760	Corrosive	173.244	173.264	1 quart	1 gallon	1	1	
	Xenon	Nonflammable gas	UN2036	Nonflammable gas	173.306	173.302	150 pounds	300 pounds	1,2	1,2	

	X-ray film *See* Film										
E	Xylene (*xylol*) (*RQ-1000/454*)	Flammable liquid	UN1307	Flammable liquid	173.118	173.119	1 quart	10 gallons	1,2	1.	
EA	Xylenol (*RQ-1000/454*)	ORM-A	UN2261	None	173.535	173.510	100 pounds	No limit	1,2	1,2	
	Xylyl bromide	Irritating material	UN1701	Irritant	None	173.382	Forbidden	75 pounds	1	5	Stow away from living quarters
	p-Xylyl diazide	Forbidden									
E	Zinc acetate (*RQ-1000/454*)	ORM-E	NA9153	None	None	173.510	No limit	No limit	1,2	1,2	
E	Zinc ammonium chloride (*RQ-5000/2270*)	ORM-E	NA9154	None	None	173.510	No limit	No limit	1,2	1,2	
	Zinc ammonium nitrite	Oxidizer	UN1512	Oxidizer	None	173.228	25 pounds	100 pounds	1,3	5	This material may be forbidden in water transportation by certain countries
	Zinc arsenate	Poison B	UN1712	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
	Zinc arsenite, solid	Poison B	UN1712	Poison	173.364	173.365	50 pounds	200 pounds	1,2	1,2	
E	Zinc borate (*RQ-1000/454*)	ORM-E	NA9155	None	None	173.510	No limit	No limit	1,2	1,2	
E	Zinc bromide (*RQ-5000/2270*)	ORM-E	NA9156	None	None	173.510	No limit	No limit	1,2	1,2	
E	Zinc carbonate (*RQ-1000/454*)	ORM-E	NA9157	None	None	173.510	No limit	No limit	1,2	1,2	
	Zinc chlorate	Oxidizer	UN1513	Oxidizer	173.153	173.163	25 pounds	100 pounds	1,2	1,2	Stow separate from ammonium compounds and away from powdered metals
E	Zinc chloride, solid (*RQ-5000/2270*)	ORM-E	UN2331	None	None	173.510	No limit	No limit	1,2	1,2	
E	Zinc chloride solution (*RQ-5000/2270*)	Corrosive material	UN1840	Corrosive	173.244	173.245	1 quart	1 quart	1,2	1,2	
E	Zinc cyanide (*RQ-10/4.54*)	Poison B	UN1713	Poison	173.370	173.370	25 pounds	200 pounds	1,2	1,2	Stow away from acids
	Zinc ethyl. See Pyrophoric liquid, n.o.s.										
E	Zinc fluoride (*RQ-1000/454*)	ORM-E	NA9158	None	None	173.510	No limit	No limit	1,2	1,2	
E	Zinc formate (*RQ-1000/454*)	ORM-E	NA9159	None	None	173.510	No limit	No limit	1,2	1,2	
EA	Zinc hydrosulfite (*RQ-1000/454*)	ORM-A	UN1931	None	173.505	173.510	50 pounds	100 pounds	1,2	1,2	Keep dry. Stow away from acids and oxidizers
E	Zinc muriate solution. *See* Zinc chloride solution										
E	Zinc nitrate (*RQ-5000/2270*)	Oxidizer	UN1514	Oxidizer	173.153	173.182	25 pounds	100 pounds	1,2	1,2	
	Zinc permanganate	Oxidizer	UN1515	Oxidizer	173.153	173.154	25 pounds	100 pounds	1,2	1,2	Separate from ammonium compounds and hydrogen peroxide
	Zinc peroxide	Oxidizer	UN1516	Oxidizer	173.153	173.154	25 pounds	100 pounds	1,2	1,2	Keep dry
E	Zinc phenolsulfonate (*RQ-5000/2270*)	ORM-E	NA9160	None	None	173.510	No limit	No limit	1,2	1,2	
E	Zinc phosphide (*RQ-1000/454*)	Poison B	UN1714	Poison	173.364	173.365	25 pounds	100 pounds	1,2	1,2	Stow away from acids and oxidizers
E	Zinc silicofluoride (*RQ-5000/2270*)	ORM-E	UN2855	None	None	173.510	No limit	No limit	1,2	1,2	
E	Zinc sulfate (*RQ-1000/454*)	ORM-E	NA9161	None	None	173.510	No limit	No limit	1,2	1,2	
	Zirconium hydride	Flammable solid	UN1437	Flammable solid and Dangerous when wet	None	173.206	Forbidden	150 pounds	1,2	5	Segregation same as for flammable solids labeled Dangerous When Wet
	Zirconium metal, dry, *chemically produced, finer than 20 mesh particle size*	Flammable solid	UN2008	Flammable solid	None	173.214	Forbidden	75 pounds	1	5	Separate from flammable gases or liquids, oxidizing materials or organic peroxides
	Zirconium metal, dry, *mechanically produced, finer than 270 mesh particle size*	Flammable solid	UN2008	Flammable solid	None	173.214	Forbidden	75 pounds	1	5	Separate from flammable gases or liquids, oxidizing materials or organic peroxides
	Zirconium, metal, liquid, suspensions	Flammable liquid	UN1308	Flammable liquid	None	173.140	Forbidden	5 gallons	1	5	
	Zirconium metal, wet, *chemically produced, finer than 20 mesh particle size*	Flammable solid	UN1358	Flammable solid	None	173.214	Forbidden	150 pounds	1,2	5	
	Zirconium metal, wet, *mechanically produced, finer than 270 mesh particle size*	Flammable solid	UN1358	Flammable solid	None	173.214	Forbidden	150 pounds	1,2	5	
E	Zirconium nitrate (*RQ-5000/2270*)	Oxidizer	UN2728	Oxidizer	173.153	173.182	25 pounds	100 pounds	1,2	1,2	
	Zirconium picramate, wet *with at least 20% of water*	Flammable solid	UN1517	Flammable solid	None	173.216	Forbidden	25 pounds	1	1	Stow away from heavy metals and their salts
E	Zirconium potassium fluoride (*RQ-5000/2270*)	ORM-E	NA9162	None	None	173.510	No limit	No limit	1,2	1,2	
	Zirconium scrap (*borings, clippings, shavings, sheets, or turnings*)	Flammable solid	UN1932	Flammable solid	173.153	173.220	Forbidden	Forbidden	1	4	Separate from flammable gases or liquids, oxidizing materials, or organic peroxides

Hazardous Materials Table—Continued

(1)	(2)	(3)	(3A)	(4)	(5)		(6)		(7)		
					Packaging		Maximum net quantity in one package		Water shipments		
+/ E/ A/ W	Hazardous materials descriptions and proper shipping names	Hazard class	Identification number	Label(s) required (if not excepted)	(a) Exceptions	(b) Specific requirements	(a) Passenger carrying aircraft or railcar	(b) Cargo aircraft only	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
EA	Zirconium sulfate (*RQ-5000/2270*)	ORM-B	NA9163	None	None	173.510	100 pounds	No limit	1,2	1,2	
E	Zirconium tetrachloride, solid (*RQ-5000/2270*)	Corrosive material	UN2503	Corrosive	173.244	173.245b	25 pounds	100 pounds	1,2	1,2	

CERCLA List

Note: The following listing fulfills the requirement of section 306(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), that all "hazardous substances," as defined in that Act, shall be listed as hazardous materials under the Hazardous Materials Transportation Act. That definition includes substances listed under section 311(b)(2)(A) of the Federal Water Pollution Control Act (FWPCA). Those materials have already been listed as hazardous substances in the Hazardous Materials Table of this section, and that listing is not repeated here. The definition of "hazardous substance" in CERCLA also includes substances designated under section 307(a) of the FWPCA, section 3001 of the Solid Waste Disposal Act, and section 112 of the Clean Air Act. The following listing consists of materials designated under those authorities. Materials indicated in the listing by an asterisk (*) are also listed in the Hazardous Materials Table as hazardous substances. With respect to other materials in the following listing, those that are not forbidden materials or do not fall within a hazard class defined in this subchapter are not subject to the requirements of this subchapter.

It should be noted that section 306(b) of CERCLA provides that common and contract carriers may be held liable under that Act for the release of a "hazardous substance" as defined in that Act, after the effective date of the listing of that substance as a hazardous material under the Hazardous Materials Transportation Act.

Specific Chemical Wastes

EPA hazardous waste No.	Substance
U001	*Acetaldehyde (I)
U034	Acetaldehyde, trichloro-
U187	Acetamide, N-(4-ethoxyphenyl)-
U005	Acetamide, N-9H-fluoren-2-yl-
U112	Acetic acid, ethyl ester (I)
U144	*Acetic acid, lead salt
U214	Acetic acid, thallium (I) salt
U002	Acetone (I)
U003	Acetonitrile (I,T)
U004	Acetophenone
U005	2-Acetylaminofluorene
U006	*Acetyl Chloride (C,R,T)
U007	Acrylamide
U008	Acrylic acid (I)
U009	*Acrylonitrile
U150	Alanine, 3-[p-bis(2-chloroethyl)amino]phenyl-, L-
U011	Amitrole
U012	*Aniline (I,T)
U014	Auramine
U015	Azaserine
U010	Azirino(2',3':3,4)pyrrolo(1,2-a)indole-4,7-dione,6-amino-8-[((aminocarbonyl)oxy)methyl]-1,1a,2,8,8a,8b-hexahydro-8a-methoxy-5-methyl-
U157	Benz[j]aceanthrylene,1,2-dihydro-3-methyl-
U016	Benz[c]acridine
U016	3,4-Benzacridine
U017	Benzalchloride
U018	Benz[a]anthracene
U018	1,2-Benzanthracene
U094	1,2-Benzanthracene,7,12-dimethyl-
U012	*Benzenamine (I,T)
U014	Benzenamine, 4,4-carbonimidoylbis(N,N-dimethyl-
U049	Benzenamine, 4-chloro-2-methyl-
U093	Benzenamine, N,N-dimethyl-4-phenylazo-
U158	Benzenamine, 4,4'-methylenebis(2-chloro-
U222	Benzenamine, 2-methyl-, hydrochloride
U181	Benzenamine, 2-methyl-5-nitro-
U019	*Benzene (I,T)
U038	Benzeneacetic acid, 4-chloro-alpha-(4-chlorophenyl)-alpha-hydroxy-, ethyl ester
U030	Benzene, 1-bromo-4-phenoxy-
U037	*Benzene, chloro-
U190	1,2-Benzenedicarboxylic acid anhydride
U028	1,2-Benzenedicarboxylic acid, [bis(2-ethylhexyl)] ester
U069	*1,2-Benzenedicarboxylic acid, dibutyl ester
U088	1,2-Benzenedicarboxylic acid, diethyl ester
U102	1,2-Benzenedicarboxylic acid, dimethyl ester
U107	1,2-Benzenedicarboxylic acid, di-n-octyl ester
U070	*Benzene, 1,2-dichloro-
U071	*Benzene, 1,3-dichloro-
U072	*Benzene, 1,4-dichloro-
U017	Benzene, (dichloromethyl)-
U223	Benzene, 1,3-diisocyanatomethyl-(R,T)
U239	*Benzene, dimethyl-(I,T)
U201	*1,3-Benzenediol
U127	Benzene, hexachloro-
U056	*Benzene, hexahydro-(I)
U188	*Benzene, hydroxy-
U220	*Benzene, methyl-
U105	*Benzene, 1-methyl-2,4-dinitro-
U106	*Benzene, 1-methyl-2,6-dinitro-
U203	Benzene, 1,2-methylenedioxy-4-allyl-
U141	Benzene, 1,2-methylenedioxy-4-propenyl-
U090	Benzene, 1 2-methylenedioxy-4-propyl-
U055	Benzene, (1-methylethyl)-(I)
U169	*Benzene, nitro-(I,T)
U183	Benzene, pentachloro-
U185	Benzene, pentachloro-nitro-
U020	Benzenesulfonic acid chloride (C,R)
U020	Benzenesulfonyl chloride (C,R)
U207	Benzene, 1,2,4,5-Tetrachloro-
U023	Benzene, (trichloromethyl)-(C,R,T)
U234	Benzene, 1,3,5-trinitro-(R,T)
U021	Benzidine
U202	1,2-Benzisothiazolin-3-one, 1,1-dioxide
U120	Benzo[j,k] fluorene
U022	Benzo[a]pyrene
U022	3,4-Benzopyrene
U197	p-Benzoquinone
U023	Benzotrichloride (C,R,T)
U050	1,2-Benzphenanthrene
U085	2,2'-Bioxirane (I,T)
U021	(1,1'-Biphenyl)-4,4'-diamine
U073	(1,1'-Biphenyl)-4,4'-diamine, 3,3'-dichloro-
U091	(1,1'-Biphenyl)-4,4'-diamine, 3,3'-dimethoxy-

AVAILABLE

SPECIFIC CHEMICAL WASTES—Continued

EPA hazardous waste No	Substance
U095	(1,1'-Biphenyl)-4,4'-diamine, 3,3'-dimethyl)-
U024	Bis(2-chloroethoxy) methane
U027	Bis(2-chloroisopropyl) ether
U244	Bis(dimethylthiocarbamoyl) disulfide
U028	Bis(2-ethylhexyl) phthalate
U246	Bromine cyanide
U225	Bromoform
U030	4-Bromophenyl phenyl ether
U128	1,3-Butadiene, 1,1,2,3,4,4,-hexachloro-
U172	1-Butanamine, N-butyl-N-nitroso-
U035	Butanoic acid, 4-[Bis(2-chloroethyl) amino] benzene-
U031	1-Butanol (I)
U159	2-Butanone (I,T)
U160	2-Butanone peroxide (R,T)
U053	*2-Butenal
U074	2-Butene, 1,4,-dichloro-(I,T)
U031	n-Butyl alcohol (I)
U136	Cacodylic acid
U032	*Calcium chromate
U238	Carbamic acid, ethyl ester
U178	Carbamic acid, methylnitroso-, ethyl ester
U176	Carbamide, N-ethyl-N-nitroso-
U177	Carbamide, N-methyl-N-nitroso-
U219	Carbamide, thio-
U097	Carbamoyl chloride, dimethyl-
U215	Carbonic acid, dithallium(I) salt
U156	Carbonochloridic acid, methyl ester (I,T)
U033	Carbon oxyfluoride (R,T)
U211	*Carbon tetrachloride
U033	Carbonyl fluoride (R,T)
U034	Chloral
U035	Chlorambucil
U036	*Chlordane, technical
U026	Chlornaphazine
U037	*Chlorobenzene
U245	1-(p-Chlorobenzoyl)-5-methoxy-2-methylindole-3-acetic acid
U039	4-Chloro-m-cresol
U041	1-Chloro-2,3-epoxypropane
U042	2-Chloroethyl vinyl ether
U044	*Chloroform
U046	Chloromethyl methyl ether
U047	beta-Chloronaphthalene
U048	o-Chlorophenol
U049	4-Chloro-o-toluidine, hydrochloride
U032	*Chromic acid, calcium salt
U050	Chrysene
U051	Creosote
U052	*Cresols
U052	Cresylic acid
U053	*Crotonaldehyde
U055	Cumene (I)
U246	Cyanogen bromide
U197	1,4-Cyclohexadienedione
U056	*Cyclohexane (I)
U057	Cyclohexanone (I)
U130	*1,3-Cyclopentadiene, 1,2,3,4,5,5-hexachloro-
U058	Cyclophosphamide
U240	*2,4-D, salts and esters
U059	Daunomycin
U060	*DDD
U061	*DDT
U142	*Decachlorooctahydro-1,3,4-metheno-2H-cyclobuta [c,d]-pentalen-2-one
U062	Diallate
U133	Diamine (R,T)
U221	Diaminotoluene
U063	Dibenz [a,h] anthracene

SPECIFIC CHEMICAL WASTES—Continued

EPA hazardous waste No.	Substance
U063	1,2:5,6-Dibenzanthracene
U064	1,2:7,8-Dibenzopyrene
U064	Dibenz [a,i] pyrene
U066	1,2-Dibromo-3-chloropropane
U069	*Dibutyl phthalate
U062	S-(2,3-Dichloroallyl) diisopropylthiocarbamate
U070	*o-Dichlorobenzene
U071	*m-Dichlorobenzene
U072	*p-Dichlorobenzene
U073	3,3'-Dichlorobenzidine
U074	1,4-Dichloro-2-butene (I,T)
U075	Dichlorodifluoromethane
U192	3,5-Dichloro-N-(1,1-dimethyl-2-propynyl) benzamide
U060	*Dichloro diphenyl dichloroethane
U061	*Dichloro diphenyl trichloroethane
U078	*1,1-Dichloroethylene
U079	1,2-Dichloroethylene
U025	Dichloroethyl ether
U081	2,4-Dichlorophenol
U082	2,6-Dichlorophenol
U240	*2,4-Dichlorophenoxyacetic acid, salts and esters
U083	*1,2-Dichloropropane
U084	*1,3-Dichloropropene
U085	1,2:3,4-Diepoxybutane (I,T)
U108	1,4-Diethylene dioxide
U086	N,N-Diethylhydrazine
U087	O-O-Diethyl-S-methyl-dithiophosphate
U088	Diethyl phthalate
U089	Diethylstilbestrol
U148	1,2-Dihydro-3,6-pyradizinedione
U090	Dihydrosafrole
U091	3,3'-Dimethoxybenzidine
U092	*Dimethylamine (I)
U093	Dimethylaminoazobenzene
U094	7,12-Dimethylbenz[a] anthracene
U095	3,3'-Dimethylbenzidine
U096	alpha,alpha-Dimethylbenzylhydroperoxide (R)
U097	Dimethylcarbamoyl chloride
U098	1,1-Dimethylhydrazine
U099	1,2-Dimethylhydrazine
U101	*2,4-Dimethylphenol
U102	Dimethyl phthalate
U103	Dimethyl sulfate
U105	*2,4-Dinitrotoluene
U106	*2,6-Dinitrotoluene
U107	Di-n-octyl phthalate
U108	1,4-Dioxane
U109	1,2-Diphenylhydrazine
U110	Dipropylamine (I)
U111	Di-n-propylnitrosamine
U001	*Ethanal (I)
U174	Ethanamine, N-ethyl-N-nitroso-
U067	*Ethane, 1,2-dibromo-
U076	Ethane, 1,1-dichloro-
U077	*Ethane, 1,2-dichloro-
U114	1,2-Ethanediylbiscarbamodithioic acid
U131	Ethane, 1,1,1,2,2,2-hexachloro-
U024	Ethane, 1,1'-[methylenebis(oxy)]bis [2-chloro-
U003	*Ethanenitrile (I,T)
U117	Ethane, 1,1'-oxybis-(I)
U025	Ethane, 1,1'-oxybis [2-chloro-
U184	Ethane, pentachloro-
U208	Ethane, 1,1,1,2-tetrachloro-
U209	Ethane, 1,1,2,2-tetrachloro-
U218	Ethanethioamide
U227	Ethane, 1,1,2-trichloro-

SPECIFIC CHEMICAL WASTES—Continued

EPA hazardous waste No	Substance
U043	Ethene, chloro-
U042	Ethene, 2-chloroethoxy-
U078	*Ethene, 1,1-dichloro-
U079	Ethene, trans-1,2-dichloro-
U210	Ethene, 1,1,2,2-tetrachloro-
U173	Ethanol, 2,2'-(nitrosoimino)bis-
U004	Ethanone, 1-phenyl-
U006	*Ethanoyl chloride (C,R,T)
U112	Ethyl acetate (I)
U113	Ethyl acrylate (I)
U238	Ethyl carbamate (urethan)
U038	Ethyl 4,4'-dichlorobenzilate
U114	Ethylenebis(dithiocarbamic acid)
U067	*Ethylene dibromide
U077	*Ethylene dichloride
U115	Ethylene oxide (I,T)
U116	Ethylene thiourea
U117	Ethyl ether (I)
U076	Ethylidene dichloride
U118	Ethyl methacrylate
U119	Ethyl methanesulfonate
U139	Ferric dextran
U120	Fluoranthene
U122	*Formaldehyde
U123	*Formic acid (C,T)
U124	Furan (I)
U125	*2-Furancarboxaldehyde (I)
U147	*2,5-furandione
U213	Furan, tetrahydro- (I)
U125	*Furfural (I)
U124	Furfuran (I)
U206	D-Glucopyranose, 2-deoxy-2(3-methyl-3-nitrosoureido)-
U126	Glycidylaldehyde
U163	Guanidine, N-nitroso-N-methyl-N'-nitro-
U127	Hexachlorobenzene
U128	Hexachlorobutadiene
U129	*Hexachlorocyclohexane (gamma isomer)
U130	*Hexachlorocyclopentadiene
U131	Hexachloroethane
U132	Hexachlorophene
U243	Hexachloropropene
U133	Hydrazine (R,T)
U086	Hydrazine, 1,2-diethyl-
U098	Hydrazine, 1,1-dimethyl-
U099	Hydrazine, 1,2-dimethyl-
U109	Hydrazine, 1,2-diphenyl-
U134	*Hydrofluoric acid (C,T)
U134	*Hydrogen fluoride (C,T)
U135	Hydrogen sulfide
U096	Hydroperoxide, 1-methyl-1-phenylethyl- (R)
U136	Hydroxydimethylarsine oxide
U116	2-imidazolidinethione
U137	Indeno [1,2,3-cd] pyrene
U245	Indomethacin
U139	Iron dextran
U140	Isobutyl alcohol (I,T)
U141	Isosafrole
U142	*Kepone
U143	Lasiocarpine
U144	*Lead acetate
U145	Lead phosphate
U146	Lead subacetate
U129	*Lindane
U147	*Maleic anhydride
U148	Maleic hydrazide
U149	Malononitrile
U150	Melphalan
U151	Mercury

SPECIFIC CHEMICAL WASTES—Continued

EPA hazardous waste No.	Substance
U152	Methacrylonitrile (I,T)
U092	*Methanamine, N-methyl-(I)
U029	Methane, bromo-
U045	Methane, chloro-(I,T)
U046	Methane, chloromethoxy-
U068	Methane, dibromo-
U080	Methane, dichloro-
U075	Methane, dichlorodifluoro-
U138	Methane, iodo-
U119	Methanesulfonic acid, ethyl ester
U211	*Methane, tetrachloro-
U153	Methanethiol (I,T)
U225	Methane, tribromo-
U044	*Methane, trichloro-
U121	Methane, trichlorofluoro-
U123	*Methanoic acid (C,T)
U036	*4,7-Methanoindan, 1,2,4,5,6,7,8,8-octachloro-3a,4,- 7,7a-tetrahydro-
U154	Methanol (I)
U155	Methapyrilene
U154	Methyl alcohol (I)
U029	Methyl bromide
U186	1-Methylbutadiene (I)
U045	Methyl chloride (I,T)
U156	Methyl chlorocarbonate (I,T)
U226	Methyl chloroform
U157	3-Methylcholanthrene
U158	4,4'-Methylenebis(2-chloroaniline)
U132	2,2'-Methylenebis(3,4,6-trichlorophenol)
U068	Methylene bromide
U080	Methylene chloride
U122	*Methylene oxide
U159	Methyl ethyl ketone (I,T)
U160	Methyl ethyl ketone peroxide (R,T)
U138	Methyl iodide
U161	Methyl isobutyl ketone (I)
U162	*Methyl methacrylate (I,T)
U163	N-Methyl-N'-nitro-N-nitrosoguanidine
U161	4-Methyl-2-pentanone (I)
U164	Methylthiouracil
U010	Mitomycin C
U059	5,12-Naphthacenedione, (8S-cis)-8-acetyl-10-[(3-amino-2,3,- 6-trideoxy-alpha-L-lyxo-hexopyranosyl) oxyl]-7,8,9,10-tetrahydro-6,8,11-trihydroxy-1-methoxy-
U165	*Naphthalene
U047	Naphthalene, 2-chloro-
U166	1,4-Naphthalenedione
U236	2,7-Naphthalenedisulfonic acid, 3,3'-[(3,3'-dimethyl-(1,1'-biphenyl)-4,4'diyl)]-bis(azo)bis(5-amino-4 hydroxy)-, tetrasodium salt
U166	1,4-Naphthoquinone
U167	1-Naphthylamine
U168	2-Naphthylamine
U167	alpha-Naphthylamine
U168	beta-Naphthylamine
U026	2-Naphthylamine, N,N'-bis(2-chloromethyl)-
U169	*Nitrobenzene (I,T)
U170	*p-Nitrophenol
U171	2-Nitropropane (I)
U172	N-Nitrosodi-n-butylamine
U173	N-Nitrosodiethanolamine
U174	N-Nitrosodiethylamine
U111	N-Nitrosodi-n-propylamine
U176	N-Nitroso-N-ethylurea
U177	N-Nitroso-N-methylurea
U178	N-Nitroso-N-methylurethane
U179	N-Nitrosopiperidine

SPECIFIC CHEMICAL WASTES—Continued

EPA hazardous waste No.	Substance
U180	N-Nitrosopyrrolidine
U181	5-Nitro-o-toluidine
U193	1,2-Oxathiolane, 2,2-dioxide
U058	2H-1,3,2 Oxazaphosphorine, 2-[bis(2-chloroethyl) amino] tetrahydro-2-oxide
U115	Oxirane (I,T)
U041	*Oxirane, 2-(chloromethyl)-
U182	Paraldehyde
U183	Pentachlorobenzene
U184	Pentachloroethane
U185	Pentachloronitrobenzene
U242	*Pentachlorophenol
U186	1,3-Pentadiene (I)
U187	Phenacetin
U188	*Phenol
U048	Phenol, 2-chloro-
U039	Phenol, 4-chloro-3-methyl-
U081	Phenol, 2,4-dichloro-
U082	Phenol, 2,6-dichloro-
U101	*Phenol, 2,4-dimethyl-
U170	*Phenol, 4-nitro-
U242	*Phenol, pentachloro-
U212	Phenol, 2,3,4,6-tetrachloro-
U230	*Phenol, 2,4,5-trichloro-
U231	*Phenol, 2,4,6-trichloro-
U137	1,10-(1,2-Phenylene)pyrene
U145	Phosphoric acid, lead salt
U087	Phosphorodithioic acid, O,O-diethyl-, S-methyl ester
U189	Phosphorous sulfide (R)
U190	Phthalic anhydride
U191	2-Picoline
U192	Pronamide
U194	1-Propanamine (I,T)
U110	1-Propanamine, N-propyl-(I)
U066	Propane, 1,2-dibromo-3-chloro-
U149	Propanedinitrile
U171	Propane, 2-nitro-(I)
U027	Propane, 2,2'oxybis[2-chloro-
U193	1,3-Propane sultone
U235	1-Propanol, 2,3-dibromo-, phosphate (3:1)
U126	1-Propanol, 2,3-epoxy-
U140	1-Propanol, 2-methyl-(I,T)
U002	2-Propanone (I)
U007	2-Propenamide
U084	*Propene, 1,3-dichloro-
U243	1-Propene, 1,1,2,3,3,3-hexachloro-
U009	*2-Propenenitrile
U152	2-Propenenitrile, 2-methyl-(I,T)
U008	2-Propenoic acid (I)
U113	2-Propenoic acid, ethyl ester (I)
U118	2-Propenoic acid, 2-methyl-, ethyl ester
U162	*2-Propenoic acid, 2-methyl-, methyl ester (I,T)
U233	*Propionic acid, 2-(2,4,5-trichlorophenoxy)-
U194	n-Propylamine (I,T)
U083	*Propylene dichloride
U196	Pyridine
U155	Pyridine, 2-[(2-dimethylamino)ethyl)-2-thenylamino]-
U179	Pyridine, hexahydro-N-nitroso-
U191	Pyridine, 2-methyl-
U164	4(1H)-Pyrimidinone, 2,3-dihydro-6-methyl-2-thioxo-
U180	Pyrrole, tetrahydro-N-nitroso-
U200	Reserpine
U201	*Resorcinol
U202	Saccharin and salts
U203	Safrole

SPECIFIC CHEMICAL WASTES—Continued

EPA hazardous waste No.	Substance
U204	Selenious acid
U204	*Selenium dioxide
U205	Selenium disulfide (R,T)
U015	L-Serine, diazoacetate (ester)
U233	*Silvex
U089	4,4'-Stilbenediol, alpha, alpha'-diethyl-
U206	Streptozotocin
U135	Sulfur hydride
U103	Sulfuric acid, dimethyl ester
U189	Sulfur phosphide (R)
U205	Sulfur selenide (R,T)
U232	*2,4,5-T
U207	1,2,4,5-Tetrachlorobenzene
U208	1,1,1,2-Tetrachloroethane
U209	1,1,2,2-Tetrachloroethane
U210	Tetrachloroethylene
U212	2,3,4,6-Tetrachlorophenol
U213	Tetrahydrofuran (I)
U214	Thallium(I) acetate
U215	Thallium(I) carbonate
U216	Thallium(I) chloride
U217	Thallium(I) nitrate
U218	Thioacetamide
U153	Thiomethanol (I,T)
U219	Thiourea
U244	Thiram
U220	Toluene
U221	Toluenediamine
U223	Toluene diisocyanate (R,T)
U222	o-Toluidine hydrochloride
U011	1H-1,2,4-Triazol-3-amine
U226	1,1,1-Trichloroethane
U227	1,1,2-Trichloroethane
U228	*Trichloroethene
U228	*Trichlorethylene
U121	Trichloromonofluoromethane
U230	*2,4,5-Trichlorophenol
U231	*2,4,6-Trichlorophenol
U232	*2,4,5-Trichlorophenoxyacetic acid
U234	sym-Trinitrobenzene (R,T)
U182	1,3,5-Trioxane, 2,4,5-trimethyl-
U235	Tris(2,3-dibromopropyl) phosphate
U236	Trypan blue
U237	Uracil, 5[bis(2-chloromethyl)amino]-
U237	Uracil mustard
U043	Vinyl chloride
U239	*Xylene (I)
U200	Yohimban-16-carboxylic acid, 11,17-dimethoxy-18-[(3,4,5-trimethoxy-benzoyl)oxy]-, methylester
P012	*Arsenic(III) oxide
P011	*Arsenic pentoxide
P011	*Arsenic(V) oxide
P012	*Arsenic trioxide
P038	Arsine, diethyl-
P054	Aziridine
P013	*Barium cyanide
P024	Benzenamine, 4-chloro-
P077	Benzenamine, 4-nitro-
P028	*Benzene, (chloromethyl)-
P042	1,2-Benzenediol, 4-[1-hydroxy-2-(methylamino) ethyl]-
P014	Benzenethiol
P028	*Benzyl chloride
P015	Beryllium dust
P016	Bis(chloromethyl) ether
P017	Bromoacetone
P018	Brucine
P021	*Calcium cyanide

SPECIFIC CHEMICAL WASTES—Continued

EPA hazardous waste No.	Substance
P123	Camphene, octachloro-
P103	Carbamimidoselenoic acid
P022	*Carbon bisulfide
P022	*Carbon disulfide
P095	*Carbonyl chloride
P033	*Chlorine cyanide
P023	Chloroacetaldehyde
P024	p-Chloroaniline
P026	1-(o-Chlorophenyl)thiourea
P027	3-Chloropropionitrile
P029	Copper cyanides
P030	Cyanides (soluble cyanide salts), not elsewhere specified
P031	Cyanogen
P033	*Cyanogen chloride
P036	Dichlorophenylarsine
P037	*Dieldrin
P038	Diethylarsine
P039	*O,O-Diethyl S-[2-(ethylthio)ethyl] phosphorodithioate
P041	Diethyl-p-nitrophenyl phosphate
P040	O,O-Diethyl O-pyrazinyl phosphorothioate
P043	Diisopropyl fluorophosphate
P044	Dimethoate
P045	3,3-Dimethyl-1-(methylthio)-2-butanone, O-[(methyl- amino)carbonyl] oxime
P071	*O,O-Dimethyl O-p-nitrophenyl phosphorothioate
P082	Dimethylnitrosamine
P046	alpha,alpha-Dimethylphenethylamine
P047	4,6-Dinitro-o-cresol and salts
P034	4,6-Dinitro-o-cyclohexylphenol
P048	*2,4-Dinitrophenol
P020	Dinoseb
P085	Diphosphoramide, octamethyl-
P039	*Disulfoton
P049	2,4-Dithiobiuret
P109	Dithiopyrophosphoric acid, tetraethyl ester
P050	*Endosulfan
P088	Endothall
P051	*Endrin
P042	Epinephrine
P046	Ethanamine,1,1-dimethyl-2-phenyl-
P084	Ethenamine,N-methyl-N-nitroso-
P101	Ethyl cyanide
P054	Ethylenimine
P097	Famphur
P056	Fluorine
P057	Fluoroacetamide
P058	Fluoroacetic acid, sodium salt
P065	Fulminic acid, mercury (II) salt (R,T)
P059	*Heptachlor
P051	*1,2,3,4,10,10-Hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-endo,endo-1,4:5,8-dimethanonaphthalene
P037	*1,2,3,4,10,10-Hexachloro-6,7-epoxy,1,4,4a,5,6,7,8,8a-octahydro-endo,exo-1,4:5,8-dimethanonaphthalene
P060	1,2,3,4,10,10-Hexachloro-1,4,4a,5,8,8a-hexahydro-1,4:5,8-endo,endo-dimethanonaphthalene
P004	*1,2,3,4,10,10-Hexachloro-1,4,4a,5,8,8a-hexahydro-1,4:5,8-endo,exo-dimethanonaphthalene
P060	Hexachlorohexahydro-exo,exo-dimethanonaphthalene
P062	Hexaethyl tetraphosphate
P116	Hydrazinecarbothioamide
P068	Hydrazine, methyl-

SPECIFIC CHEMICAL WASTES—Continued

EPA hazardous waste No.	Substance
P063	*Hydrocyanic acid
P063	*Hydrogen cyanide
P096	Hydrogen phosphide
P064	Isocyanic acid, methyl ester
P007	3(2H)-Isoxazolone,5-(aminomethyl)-
P092	Mercury,(acetato-O)phenyl-
P065	Mercury fulminate (R,T)
P016	Methane,oxybis(chloro-
P112	Methane, tetranitro-(R)
P118	Methanethiol, trichloro-
P059	*4,7-Methano-1H-indene,1,4,5,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-
P066	Methomyl
P067	2-Methylaziridine
P068	Methyl hydrazine
P064	Methyl isocyanate
P069	*2-Methyllactonitrile
P071	*Methyl parathion
P072	alpha-Naphthylthiourea
P073	Nickel carbonyl
P074	Nickel cyanide
P074	Nickel(II) cyanide
P073	Nickel tetracarbonyl
P075	Nicotine and salts
P076	Nitric oxide
P077	p-Nitroaniline
P078	*Nitrogen dioxide
P076	Nitrogen(II) oxide
P078	*Nitrogen(IV) oxide
P081	Nitroglycerine (R)
P082	N-Nitrosodimethylamine
P084	N-Nitrosomethylvinylamine
P050	*5-Norbornene-2,3-dimethanol, 1,4,5,6,7,7-Hexachloro cyclic sulfite
P085	Octamethylpyrophosphoramide
P087	Osmium oxide
P087	Osmium tetroxide
P088	7-Oxabicyclo[2.2.1] heptane-2,3-dicarboxylic acid
P089	*Parathion
P034	Phenol, 2-cyclohexyl-4,6-dinitro-
P048	*Phenol, 2,4-dinitro-
P047	Phenol, 2,4-dinitro-6-methyl-
P020	Phenol, 2,4-dinitro-6-(1-methylpropyl)-
P009	Phenol, 2,4,6-trinitro-, ammonium salt (R)
P036	Phenyl dichloroarsine
P092	Phenylmercuric acetate
P093	N-Phenylthiourea
P094	Phorate
P095	*Phosgene
P096	Phosphine
P041	Phosphoric acid, diethyl p-nitrophenyl ester
P044	Phosphorodithioic acid, 0,0-dimethyl S-[2-(methyl-amino)-2-oxoethyl] ester
P043	Phosphorofluoric acid, bis(l-methylethyl) ester
P094	Phosphorothioic acid, O,O-diethyl S-(ethylthio)methyl ester
P089	*Phosphorothioic acid, O,O-diethyl O-(p-nitrophenyl) ester
P040	Phosphorothioic acid, O-O-diethyl O-pyrazinyl ester
P097	Phosophorothioic acid, O,O-dimethyl O-[p-((dimethyl-amino)-sulfonyl)phenyl) ester
P110	*Plumbane, tetraethyl-
P098	*Potassium cyanide
P099	Potassium silver cyanide
P070	Propanal, 2-methyl-2-(methylthio)-, O-[(methylamino) carbonyl] oxime
P101	Propanenitrile

SPECIFIC CHEMICAL WASTES—Continued

EPA hazardous waste No	Substance
P027	Propanenitrile, 3-chloro-
P069	*Propanenitrile, 2-hydroxy-2-methyl-
P081	1,2,3-Propanetriol, trinitrate (R)
P017	2-Propanone, 1-bromo-
P102	Propargyl alcohol
P003	*2-Propenal
P005	*2-Propen-1-ol
P067	1,2-Propylenimine
P102	2-Propyn-1-ol
P008	4-Pyridinamine
P075	Pyridine, (S)-3-(1-methyl-2-pyrrolidinyl)-, and salts
P111	*Pyrophosphoric acid, tetraethyl ester
P103	Selenourea
P104	Silver cyanide
P105	Sodium azide
P106	*Sodium cyanide
P107	Strontium sulfide
P108	*Strychnidin-10-one, and salts
P018	Strychnidin-10-one, 2,3-dimethoxy-
P108	Strychnine and salts
P115	*Sulfuric acid, thallium(I) salt
P109	Tetraethyldithiopyrophosphate
P110	*Tetraethyl lead
P111	*Tetraethylpyrophosphate
P112	Tetranitromethane (R)
P062	Tetraphosphoric acid, hexaethyl ester
P113	Thallic oxide
P113	Thallium(III) oxide
P114	Thallium(I) selenite
P115	*Thallium(I) sulfate
P045	Thiofanox
P049	Thioimidodicarbonic diamide
P014	Thiophenol
P116	Thiosemicarbazide
P026	Thiourea, (2-chlorophenyl)-
P072	Thiourea, 1-naphthalenyl-
P093	Thiourea, phenyl-
P123	*Toxaphene
P118	Trichloromethanethiol
P119	Vanadic acid, ammonium salt
P120	*Vanadium pentoxide
P120	*Vanadium(V) oxide
P001	*Warfarin
P121	*Zinc cyanide
P122	*Zinc phosphide (R,T)
F001	The following spent halogenated solvents used in degreasing: tetrachloroethylene, trichloroethylene, methylene chloride, 1,1,1-trichloroethane, carbon tetrachloride, and chlorinated fluorocarbons; and sludges from the recovery of these solvents in degreasing operations.
F002	The following spent halogenated solvents: tetrachloroethylene, methylene chloride, trichloroethylene 1,1,1-trichloroethane, chlorobenzene, 1,1,2-trichloro-1,2,2-trifluoroethane, orthodichlorobenzene, and trichlorofluoromethane; and the still bottoms from the recovery of these solvents.
F003	The following spent non-halogenated solvents: xylene, acetone, ethyl acetate, ethyl benzene, ethyl ether, methyl isobutyl ketone, n-butyl alcohol, cyclohexanone, and methanol; and the still bottoms from the recovery of these solvents.

SPECIFIC CHEMICAL WASTES—Continued

EPA hazardous waste No.	Substance
F004	The following spent non-halogenated solvents: cresols and cresylic acid, and nitrobenzene; and the still bottoms from the recovery of these solvents.
F005	The following spent non-halogenated solvents: toluene, methyl ethyl ketone, carbon disulfide, isobutanol, and pyridine; and the still bottoms from the recovery of these solvents.
F006	Wastewater treatment sludges from electroplating operations except from the following processes: (1) sulfuric acid anodizing of aluminum; (2) tin plating on carbon steel; (3) zinc plating (segregated basis) on carbon steel; (4) aluminum or zinc-aluminum plating on carbon steel; (5) cleaning/stripping associated with tin, zinc and aluminum plating on carbon steel; and (6) chemical etching and milling of aluminum.
F019	Wastewater treatment sludges for the chemical conversion coating of aluminum.
F007	Spent cyanide plating bath solutions from electroplating operations (except for precious metals electroplating spent cyanide plating bath solutions).
F008	Plating bath sludges from the bottom of plating baths from electroplating operations where cyanides are used in the process (except for precious metals electroplating plating bath sludges).
F009	Spent stripping and cleaning bath solutions from electroplating operations where cyanides are used in the process (except for precious metals electroplating spent stripping and cleaning bath solutions).
F010	Quenching bath sludge from oil baths from metal heat treating operations where cyanides are used in the process (except for precious metals heat-treating quenching bath sludges).
F011	Spent cyanide solutions from salt bath pot cleaning from metal heat treating operations (except for precious metals heat treating spent cyanide solutions from salt bath pot cleaning).
F012	Quenching wastewater treatment sludges from metal heat treating operations where cyanides are used in the process (except for precious metals heat treating quenching wastewater treatment sludges).
F015	Spent cyanide bath solutions from mineral metals recovery operations.
K001	Bottom sediment sludge from the treatment of wastewaters from wood preserving processes that use creosote and/or pentachlorophenol.
K002	Wastewater treatment sludge from the production of chrome yellow and orange pigments.
K003	Wastewater treatment sludge from the production of molybdate orange pigments.
K004	Wastewater treatment sludge from the production of zinc yellow pigments.
K005	Wastewater treatment sludge from the production of chrome green pigments.
K006	Wastewater treatment sludge from the production of chrome oxide green pigments (anhydrous and hydrated).

SPECIFIC CHEMICAL WASTES—Continued

EPA hazardous waste No.	Substance
K007	Wastewater treatment sludge from the production of iron blue pigments.
K008	Oven residue from the production of chrome oxide green pigments.
K009	Distillation bottoms from the production of acetaldehyde from ethylene.
K010	Distillation side cuts from the production of acetaldehyde from ethylene.
K011	Bottom stream from the wastewater stripper in the production of acrylonitrile.
K013	Bottom stream from the acetonitrile column in the production of acrylonitrile.
K014	Bottoms from the acetonitrile purification column in the production of acrylonitrile.
K015	Still bottoms from the distillation of benzyl chloride.
K016	Heavy ends or distillation residues from the production of carbon tetrachloride.
K017	Heavy ends (still bottoms) from the purification column in the production of epichlorohydrin.
K018	Heavy ends from the fractionation column in ethyl chloride production.
K019	Heavy ends from the distillation of ethylene dichloride in ethylene dichloride production.
K020	Heavy ends from the distillation of vinyl dichloride in vinyl chloride monomer production.
K021	Aqueous spent antimony catalyst waste from fluoromethanes production.
K022	Distillation bottom tars from the production of phenol/acetone from cumene.
K023	Distillation light ends from the production of phthalic anhydride from naphthalene.
K024	Distillation bottoms from the production of phthalic anhydride from naphthalene.
K093	Distillation light ends from the production of phthalic anhydride from ortho-xylene.
K094	Distillation bottoms from the production of phthalic anhydride from ortho-xylene.
K025	Distillation bottoms from the production of nitrobenzene by the nitration of benzene.
K026	Stripping still tails from the production of methyl ethyl pyridines.
K027	Centrifuge and distillation residues from toluene diisocyanate production.
K028	Spent catalyst from the hydrochlorinator reactor in the production of 1,1,1-trichloroethane.
K029	Waste from the product steam stripper in the production of 1,1,1-trichloroethane.
K095	Distillation bottoms from the production of 1,1,1-trichloroethane.
K096	Heavy ends from the heavy ends column from the production of 1,1,1-trichloroethane.
K030	Column bottoms or heavy ends from the combined production of trichloroethylene and perchloroethylene.
K083	Distillation bottoms from aniline production.
K103	Process residues from aniline extraction from the production of aniline.
K104	Combined wastewater streams generated from nitrobenzene/aniline production.
K085	Distillation or fractionation column bottoms from the production of chlorobenzenes.
K105	Separated aqueous stream from the reactor product washing step in the production of chlorobenzenes.

SPECIFIC CHEMICAL WASTES—Continued

EPA hazardous waste No.	Substance
K071	Brine purification muds from the mercury cell process in chlorine production, where separately prepurified brine is not used.
K073	Chlorinated hydrocarbon waste from the purification step of the diaphram cell process using graphite anodes in chlorine production.
K106	Wastewater treatment sludge from the mercury cell process in chlorine production.
K031	By-product salts generated in the production of MSMA and cacodylic acid.
K032	Wastewater treatment sludge from the production of chlordane.
K033	Wastewater and scrub water and scrub water from the chlorination of cyclopentadiene in the production of chlordane.
K034	Filter solids from the filtration of hexachlorocyclopentadiene in the production of chlordane.
K097	Vacuum stripper discharge from the chlordane chlorinator in the production of chlordane.
K035	Wastewater treatment sludges generated in the production of creosote.
K036	Still bottoms from toluene reclamation distillation in the production of disulfoton.
K037	Wastewater treatment sludges from the production of disulfoton.
K038	Wastewater from the washing and stripping of phorate production.
K039	Filter cake from filtration of diethylphosphorodithioic acid in the production of phorate.
K040	Wastewater treatment sludge from the production of phorate.
K041	Wastewater treatment sludge from the production of toxaphene.
K098	Untreated process wastewater from the production to toxaphene.
K042	Heavy ends or distillation residues from the distillation of tetrachlorobenzene in the production of 2,4,5-T.
K043	2,6-Dichlorophenol waste from the production of 2,4-D.
K099	Untreated wastewater from the production of 2,4-D.
K044	Wastewater treatment sludges from the manufacturing and processing of explosives.
K045	Spent carbon from the treatment of wastewater containing explosives.
K046	Wastewater treatment sludges from the manufacturing, formulation and loading of lead-based initiating compounds.
K047	Pink/red water from TNT operations.
K048	Dissolved air flotation (DAF) float from the petroleum refining industry.
K049	Slop oil emulsion solids from the petroleum refining industry.
K050	Heat exchanger bundle cleaning sludge from the petroleum refining industry.
K051	API separator sludge from the petroleum refining industry.
K052	Tank bottoms (leaded) from the petroleum refining industry.
K061	Emission control dust/sludge from the primary production of steel in electric furnaces.
K062	Spent pickle liquor from steel finishing operations.

SPECIFIC CHEMICAL WASTES—Continued

EPA hazardous waste No	Substance
K069	Emission control dust/sludge from secondary lead smelting.
K100	Waste leaching solution from acid leaching of emission control dust/sludge from secondary lead smelting.
K084	Wastewater treatment sludges generated during the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds.
K101	Distillation tar residues form the distillation of aniline-based compounds in the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds.
K102	Residue from the use of activated carbon for decolorization in the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds.
K086	Solvent washes and sludges, caustic washes and sludges, or water washes and sludges from cleaning tubs and equipment used in the formulation of ink from pigments, driers, soaps, and stabilizers containing chromium and lead.
K060	Ammonia still lime sludge from coking operations.
K087	Decanter tank tar sludge from coking operations.

CHEMICALS LISTED BY EPA UNDER SECTION 307(a) OF THE CLEAN WATER ACT

Acenaphthylene
Acenaphthene
*Acetic acid
*Acrolein
Anthracene
Antimony
*Antimony pentachloride
*Antimony potassium tartrate
*Antimony tribromide
*Antimony trichloride
*Antimony trifluoride
*Antimony trioxide
Arsenic
Arsenic acid
*Arsenic disulfide
*Arsenic pentoxide
*Arsenic trichloride
*Arsenic trioxide
Asbestos
Benz[a] anthracene
*Benzene
Benzidine
Benzo[b] fluoranthene
Benzo[k] fluoranthene
2-Chloroethyl vinyl ether
*Chloroform
Chloromethane
Chloromethyl methyl ether
Chloronaphthalene (all isomers)
2-Chloronaphthalene
Chlorophenol

2-Chlorophenol
2-Chloronaphthalene
4-Chlorophenyl phenyl ether
Benzo[ghi] perylene
Benzo[a] pyrene
Beryllium
*Beryllium chloride
*Beryllium fluoride
*Beryllium nitrate
Bis(2-chloroethoxy)methane
Bis(2-chloroethyl)ether
Bis(2-chloroisopropyl)ether
Bis(2-ethylhexyl) phthalate
Bromomethane
4-Bromophenyl phenyl ether
Butyl benzyl phthalate
*n-Butyl phthalate
Cadmium
*Cadmium acetate
*Cadmium bromide
*Cadmium chloride
*Carbon tetrachloride
*Chlordane
Chlorobenzene
Chlorodibromomethane
p-Chloro-m-cresol
Choroethene
*Cupric oxalate
*Cupric sulfate
*Cupric sulfate ammoniated
*Cupric tartrate
*Cyanides (soluble salts and complexes), n.o.s.
*Cyanogen chloride
2-Cyclohexyl-4, 6-dinitrophenol
*DDD
DDE
*DDT

CHEMICALS LISTED BY EPA UNDER SECTION 307(a) OF THE CLEAN WATER ACT—Continued

Chromium

*Chromic acetate
*Chromic acid
*Chromic sulfate
*Chromous chloride
Chrysene
Copper

Copper cyanide

*Cupric acetate
*Cupric acetoarsenite
*Cupric chloride
*Cupric nitrate
1,2-Dichloroethane
*Dichloroethylene (all isomers)
*1,1-Dichloroethylene
*1,2-Dichloroethylene
Dichloromethane
Dichloronaphthalene (all isomers)
Dichloropheno (all isomers)
2,4-Dichlorophenol
2,6-Dichlorophenol
Dichlorophenylarsine
*Dichloropropane (all isomers)
*Dichloropropene-Dichloropropane mixture
*Dichloropropene(s) (all isomers)
*1,3-Dichloropropene
*Dieldrin
Diethylarsine
Diethyl phthalate

7,12-Dimethylbenz[a] anthracene
Dimethylnitrosamine
*2,4-Dimethylphenol
Dimethyl phthalate
4,6-Dinitro-o-cresol
*Dinitrotoluene (all isomers)
Lead
*Lead acetate
*Lead arsenate
*Lead chloride
*Lead fluoborate
*Lead fluoride
*Lead iodide
*Lead nitrate
Lead phosphate
*Lead stearate
Lead subacetate
*Lead sulfate
*Lead sulfide
*Lead thiocyanate
*Mercuric cyanide
*Mercuric nitrate
*Mercuric sulfate
Mercuric thiocyanate
*Mercurous nitrate
Mercury
Nickel
*Nickel ammonium sulfate
*Nickel chloride

*Nickel hydroxide
Nickel carbonyl
Dibenz[a,h] anthracene (Dibenzo[a,h] anthracene)
Dibenzo[a,e] pyrene
Dibenzo[a,h] pyrene
Dibenzo[a,i] pyrene
Dibromomethane
*Di-n-butyl phthalate
*Dichlorobenzene (all isomers)
Dichlorobenzidine (all isomers)
3,3'-Dichlorobenzidine
Dichlorobromomethane
Dichloroethane (all isomers)
1,1-Dichloroethane
*2,4-Dinitrotoluene
*2,6-Dinitrotoluene

Di-n-octyl phthalate
Di-n-propylnitrosamine
*Endosulfan (all isomers)
Endosulfan sulfate

*Endrin and metabolites
*Ethyl benzene
Ethyl cyanide
*Ethylene dichloride
Fluoranthene

Fluorene

*Heptachlor

Heptachlor epoxide
Hexachlorobenzene
*Hexachlorobutadiene
Hexachlorocyclohexane (all isomers)
*Hexachlorocyclopentadine

Hexachloroethane
Hexachlorophene
Indeno(1,2,3-cd)pyrene
Iodomethane
Isophorone
*Nickel nitrate
*Nickel sulfate
*Nitrobenzene
*Nitrophenol (all isomers)
*2-Nitrophenol
*4-Nitrophenol
N-Nitrosodi-n-butylamine
N-Nitrosodiethanolamine
N-Nitrosodiethylamine
N-Nitrosodimethylamine
N-Nitrosodiphenylamine
N-Nitrosodi-n-propylamine
N-Nitrosomethylethylamine
N-Nitrosomethylvinylamine
Octachloronaphthalane
Pentachlorobenzene
Pentachloroethane
*Pentachlorophenol
Phenathrene
*Phenol
Phenyl dichloroarsine
Phenylmercury acetate
*Polychlorinated biphenyl(s) (PCBs)
Potassium silver cyanide
Pyrene

CHEMICALS LISTED BY EPA UNDER SECTION 307(a) OF THE CLEAN WATER ACT—Continued

Nickel cyanide
Selenium
Selenium oxide
Selenium sulfide
Silver
Silver cyanide
Silver nitrate
Tetrachlorobenzene
1,2,4,5-Tetrachlorobenzene
2,3,7,8-Tetrachlorodibenzo-p-dioxin
Tetrachloroethane (all isomers)
1,1,1,2-Tetrachloroethane
1,1,2,2-Tetrachloroethane
Tetrachloroethene (Tetrachloroethylene)
*Tetrachloromethane
Tetrachlorophenol (all isomers)
2,3,4,6-Tetrachlorophenol
*TDE
Thallium
Thallic oxide
Thallium (I) acetate
Thallium (I) carbonate
Thallium (I) chloride
Thallium (I) nitrate
Selenious acid
Trichlorfon
Trichloroethane (all isomers)
1,1,1-Trichloroethane
1,1,2-Trichloroethane
*Trichloroethylene
*Trichlorophenol (all isomers)
*2,4,5-Trichlorophenol
*2,4,6-Trichlorophenol
Vinyle chloride
Zinc
*Zinc acetate
*Zinc ammonium chloride
*Zinc borate
*Zinc bromide
*Zinc carbonate
*Zinc chloride
*Zinc cyanide
*Zinc fluoride
*Zinc formate
*Zinc hydrosulfite
*Zinc nitrate
*Zinc phenolsulfonate
*Zinc phosphide

CHEMICALS LISTED BY EPA UNDER SECTION 307(a) OF THE CLEAN WATER ACT—Continued

Thallium (I) selenite
*Thallium (I) sulfate
*Toluene
*Toxaphene
*Tribromomethane
Trichlorobenzene (all isomers)
1,2,4-Trichlorobenzene
*Zinc silicofluoride
*Zinc sulfate
*Zirconium nitrate
*Zirconium potassium fluoride
*Zirconium sulfate
*Zirconium tetrachloride

CHEMICALS LISTED BY EPA UNDER SECTION 112 OF THE CLEAN AIR ACT

*Benzene
Mercury
Radionuclides
Vinyl chloride

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 172-58, 45 FR 34588, May 22, 1980]

EDITORIAL NOTE: For Federal Register citations affecting § 172.101, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

EFFECTIVE DATE NOTE: Section 172.101 was amended at 50 FR 41095, Oct. 8, 1985, effective January 1, 1986, by adding a sentence at the end of paragraph (a) and revising the following table entries. The text set forth below remains in effect until January 1, 1986.

§ 172.101 Purpose and use of hazardous materials table.

* * * * *

E	Acetone cyanohydrin (*RQ-10/4.54*)	Poison B	UN1541	Poison	None	173.346	Forbidden	55 gallons	1	5	Shade from radiant heat. Stow away from corrosive materials
	*		*		*		*				*
E	Allyl alcohol *RQ-100/45.4*)	Flammable liquid	UN1098	Flammable liquid and Poison	None	173.119	1 quart	10 gallons	1,2	1	
	*		*		*		*				*
	n-Butyl isocyanate	Flammable liquid	UN2485	Flammable liquid and Poison	None	173.119	1 quart	10 gallons	1,2	1	
	*		*		*		*				*
E	Crotonaldehyde (*RQ-100/45.4*)	Flammable liquid	UN1143	Flammable liquid and Poison	None	173.119	1 quart	1 gallon	1,2	1	
	*		*		*		*				*
	Ethylene chlorohydrin	Poison B	UN1135	Poison		173.345 173.346	1 quart	55 gallons	1,2	1	Segregation same as for flammable liquids

•	•			•			•			•
Methyl isocyanate.	Flammable liquid	UN2480	Flammable liquid and Poison	None	173.119	Forbidden	10 gallons	1	5	Keep cool. Stow away from living quarters and sources of heat
•	•			•			•			•

§ 172.102 Purpose and use of Optional Hazardous Materials Table for international shipments.

(a) The Optional Hazardous Materials Table (Optional Table) set forth in this section provides descriptions, classifications, labeling and vessel stowage requirements which may be used for international shipments as authorized by § 171.12 of this subchapter. The Optional Table provides alternatives to corresponding requirements in § 172.101 subject to conditions set forth in this section. The provisions of this section do not apply to materials designated as hazardous materials under this subchapter that are not subject to the requirements of the IMDG Code. This section does not designate materials as hazardous materials and it does not specify packaging requirements, exceptions or limitations. They are made only in § 172.101. A number of materials listed in the Optional Table may not be subject to the requirements of this subchapter, but they are subject to regulation under widely applied international standards. They are listed in this section in the interest of providing consistency with those standards and to alert persons offering or accepting these materials for transportation that the materials may be subject to regulation in international transport.

(b) A material described, classed and labeled in accordance with this section must be in conformance with all additional defining or limiting conditions prescribed for the description in the appropriate schedule of the IMDG Code.

(c) When a material is transported by aircraft, motor vehicle, or rail transport vehicle under the description and IMO class or division provided in the Optional Table, the shipping paper required by § 172.202(a) must include the class name from Part 173 of this subchapter which most closely corresponds to the IMO class indicated for the material in the Optional Table. For example, the IMO proper shipping name, class and identification number for Ethylene oxide are "Ethylene oxide, 2.1, UN1040". While Ethylene oxide would be classed as a Flammable liquid under § 172.101, the class in Part 173 of this subchapter that most closely corresponds to the IMO class provided in the Optional Table is "Flammable gas". The proper shipping paper description would be "Ethylene oxide, 2.1, Flammable gas, UN 1040".

(d) When appropriate, the entries "IMO" or "IMO Class" may be entered immediately before or immediately following the class entry in the basic description. For example: "Ethylene oxide, IMO Class 2.1, Flammable gas, UN 1040."

(e) If a hazardous material that is a hazardous substance is offered, accepted or transported under an acceptable shipping name from the Optional Table that does not contain the name of the hazardous substance, the name of the hazardous substance shall be entered in association with the proper shipping name.

(f) Column 1 contains the letter "N" immediately adjacent to certain entries. The letter "N" means that the entry is not an acceptable alternative and the material must be transported under the appropriate entry in § 172.101.

(g) Column 2 lists the optional proper shipping names for hazardous materials. Proper shipping names are limited to those shown in Roman type (not italics). In the selection of a proper shipping name to describe a particular material, if the correct technical name is not shown, or is not appropriate, selection must be made from the general description or "n.o.s." entries corresponding to the specific hazard class of the material being shipped. The name that most appropriately describes the material must be used; e.g., an alcohol not listed by name in the Optional Table must be shipped as an "Alcohol n.o.s." rather than "Flammable liquid n.o.s." unless the technical name of the alcohol is listed, e.g., Methanol. Some mixtures may be more appropriately described by their application, such as "Paint" or "Cleaning compound".

(1) Shipping names may be entered in either upper or lower case letters.

(2) The words in italics are not part of the proper shipping name but may be used in addition to the proper shipping name. The word "or" in italics indicates that any terms in the sequence may be used as the proper shipping name, as appropriate.

(3) When one entry references another entry by use of a "*see*" and both names are in Roman type, either name may be used as a proper shipping name (e.g., Methyl alcohol. *See* Methanol).

(4) If not included in the proper shipping name in the Optional Table, the proper shipping name for a hazardous material that is a hazardous waste must include the word "Waste" preceding the name of the material. For example: Waste turpentine.

(h) Column 3 contains the hazard class or division designated for the material in the IMDG Code. In the case of explosives, a letter designating the "compatibility group" of the substance or article is also included immediately following the division. Detailed definitions of the classes, divisions, and compatibility groups are provided in the IMDG Code. Basic definitions of the IMO classes and divisions (with corresponding DOT classes shown in italics) are follows:

(1) Class 1—Explosives.

(i) Division 1.1—Substances and articles which have a mass explosion hazard. (*Explosive A*)

(ii) Division 1.2—Substances and articles which have a projection hazard but not a mass explosion hazard. (*Explosive A* or *B*)

(iii) Division 1.3—Substances and articles which have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard. (*Explosive B*)

(iv) Division 1.4—Substances and articles which present no significant hazard. (*Explosive C*)

(v) Division 1.5—Very insensitive substances. (*Blasting Agent*)

(2) Class 2—Gases (compressed, liquefied or dissolved under pressure).

(i) Division 2.1—Flammable gases. (*Flammable gas*)

(ii) Division 2.2—Nonflammable gases. (*Nonflammable gas*)

(iii) Division 2.3—Poison gases. (*Poison A*)

(3) Class 3—Flammable liquids.

(i) Division 3.1-Low flash point group (liquids with flash points below 0° F.). *Flammable liquid*

(ii) Division 3.2—Intermediate flash point group (liquids with flash points of 0° F. or above but less than 73° F.). *Flammable liquid*

(iii) Division 3.3—High flash point group (liquids with flash points of 73° F. or above up to and including 141° F.). *Flammable liquid or Combustible liquid*

(4) Class 4—Flammable solids or substances.

(i) Division 4.1—Flammable solids. *Flammable solid*

(ii) Division 4.2—Substances liable to spontaneous combustion. *Flammable solid* or, for pyroforic liquids, *Flammable liquid*

(iii) Division 4.3—Substances emitting flammable gases when wet. *Flammable solid*

(5) Class 5—Oxidizing substances.

(i) Division 5.1—Oxidizing substances or agents. *Oxidizer*

(ii) Division 5.2—Organic peroxides. *Organic peroxide*

(6) Class 6— Poisonous and infectious substances.

(i) Division 6.1—Poisonous substances. *Poison B*

(ii) Division 6.2—Infectious substances. *Etiologic agent*

(7) Class 7—Radioactive substances. *Radioactive material*

(8) Class 8—Corrosives. *Corrosive material*

(9) Class 9—Miscellaneous dangerous substances. *Other regulated material*

(i) Column 4 contains the United Nations number listed for the substance or article in the IMDG Code. A number of substances or articles have no UN number provided for them in

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the IMDG Code. For some of these entries, the UN number of the article or substance which most appropriately corresponds to that particular entry is shown in parentheses.

(j) Column 5 specifies the labels to be applied to each package. Specifications for labels for domestic and export shipments shall be either as provided in this subchapter or as provided in the IMDG Code, except that color shall be as prescribed in § 172.407(d). The label referred to as the "St. Andrews Cross" label is the "Harmful-Stow Away From Foodstuffs" label provided by IMO for materials of Class 6.1 Packaging Group III.

(k) Column 6 provides the packaging group specified for the material in the IMDG Code.

(l) Column 7 specifies each of the authorized stowage locations on board cargo vessels and passenger vessels and certain additional requirements for shipments of listed hazardous materials. Section 176.63 of this subchapter sets forth the physical requirements for each of the authorized stowage locations listed in Column 7. The authorized stowage locations are defined as follows:

(1) "1" means the material must be stowed "on deck."

(2) "2" means the material must be stowed "under deck."

(3) "3" means the material must be stowed "under deck away from heat."

(4) "1,2" means the material may be stowed either "on deck" or "under deck"; however, "under deck" stowage should be used if available.

(5) "1,3" means the material may be stowed either "on deck" or "under deck away from heat"; however, "under deck away from heat" stowage should be used if it is available.

(6) "5" means the material is forbidden and may not be offered or accepted for transportation by vessel.

(7) "6" means the material is authorized to be transported in a magazine subject to the requirements of §§ 176.135 through 176.144 of this subchapter.

Optional Hazardous Materials Table

(1) Notes and Symbols	(2) Hazardous Materials Description and Proper Shipping Names	(3) IMO Class	(4) Identification Number	(5) Label(s) required	(6) Packaging Group	(7) Vessel Stowage Requirements (a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Acetal	3.1	UN 1088	Flammable Liquid	II	1,3	5	Keep cool
	Acetaldehyde	3.1	UN 1089	Flammable Liquid	I	1,3	5	Keep cool
	Acetaldehyde ammonia	9	UN 1841	None	III	1,2	1,2	Stow 'away from' foodstuffs
	Acetaldehyde oxime	3.3	UN 2332	Flammable Liquid	II	1,2	1,2	
	Acetic acid, glacial *or* Acetic acid solution, *more than 80% acid, by weight*	8	UN 2789	Corrosive, Flammable Liquid	II	1,2	1,2	Segregation same as for flammable liquids. Glass carboys in hampers prohibited under deck
	Acetic acid solution, *more than 25% but not more than 80% acid, by weight*	8	UN 2790	Corrosive	II/III	1,2	1,2	Glass carboys in hampers prohibited under deck
	Acetic anhydride	8	UN 1715	Corrosive, Flammable Liquid	II	1,2	1,2	Stow 'separated longitudinally by an intervening complete compartment or hold from' explosives. Segregation same as for flammable liquids
	Acetone	3.1	UN 1090	Flammable Liquid	II	1,3	5	
	Acetone cyanohydrin, *stablilized*	6.1	UN 1541	Poison	I	1	5	Shade from radiant heat. Stow 'away from' acids and alkalis
	Acetone oils	3.2	UN 1091	Flammable Liquid	II	1,2	1	
	Acetonitrile *See* Methyl cyanide							
	Acetyl acetone peroxide, *maximum concentration 40% in solution*	5.2	UN 2080	Organic Peroxide	II	1	5	
	Acetyl benzoyl peroxide, *maximum concentration 45% in solution*	5.2	UN 2081	Organic Peroxide	II	1	5	
	Acetyl bromide	8	UN 1716	Corrosive	II	1	1	Keep dry. Glass carboys prohibited on passenger vessels
	Acetyl chloride	3.2	UN 1717	Flammable Liquid, Corrosive	II	1,2	1	
	Acetyl cyclohexane sulphonyl peroxide, *maximum concentration 82%, wetted with minimum 12% water*	5.2	UN 2082	Organic Peroxide	I	1	5	Control temperature −10 deg C. Emergency temperature 0 deg C
	Acetyl cyclohexane sulphonyl peroxide, *maximum concentration 32% in solution*	5.2	UN 2083	Organic Peroxide	II	1	5	Control temperature −10 deg C. Emergency temperature 0 deg C
	Acetylene, *dissolved*	2.1	UN 1001	Flammable Gas	--	1	1	Shade from radiant heat. Stow 'separated from' chlorine
	Acetyl iodide	8	UN 1898	Corrosive	II	1	1	Keep dry. Glass carboys prohibited on passenger vessels
	Acetyl methyl carbinol	3.3	UN 2621	Flammable Liquid	III	1,2	1,2	
	Acetyl peroxide, *maximum concentration 27% in solution*	5.2	UN 2084	Organic Peroxide	II	1	5	Control temperature 20 deg C. Emergency temperature 25 deg C
	Acid mixtures, spent, nitrating	8	UN 1826	Corrosive	I/II	1	5	Stow 'away from' fluorides

Optional Hazardous Materials Table—Continued

(1) es and Symbols	(2) Hazardous Materials Description and Proper Shipping Names	(3) IMO Class	(4) Identification Number	(5) Label(s) required	(6) Packaging Group	(7) Vessel Stowage Requirements (a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Acids, liquid, n.o.s. *See* Corrosive liquids, n.o.s.							
	Acridine	4.1	UN 2713	**Flammable Solid**	III	1,2	1,2	
	Acrolein dimer, *stabilized*	3.3	UN 2607	**Flammable Liquid**	II	1,2	1,2	
	Acrolein, inhibited	3.1	UN 1092	**Flammable Liquid, Poison**	I	1,3	5	Keep cool
	Acrylamide	6.1	UN 2074	**St. Andrews Cross**	III	1,2	1,2	Shade from radiant heat. Keep cool
	Acrylic acid, inhibited	8	UN 2218	Corrosive, **Flammable Liquid**	II	1	1	Shade from radiant heat. Keep cool. Segregation same as for flammable liquids. Glass carboys prohibited on passenger vessels
	Acrylonitrile, inhibited	3.2	UN 1093	**Flammable Liquid, Poison**	I	1,3	5	Keep cool
	Activated carbon. *See* Carbon, activated							
	Activated charcoal. *See* Carbon, activated							
	Adhesives, *containing a flammable liquid*	3.1	UN 1133	**Flammable Liquid**	II	1,2	5	Keep cool
		3.2	UN 1133	**Flammable Liquid**	II	1,2	1	
		3.3	UN 1133	**Flammable Liquid**	II	1,2	1,2	
	Adiponitrile	6.1	UN 2205	St. Andrews Cross	III	1,2	1,2	Shade from radiant heat
	Aerosol dispensers, *with a capacity below 1400 cubic cm.:*							
	(1) more than 10% by weight of total contents consisting of flammable gas	2.1	UN 1950	Flammable Gas	--	1,3	1,3	
	(2) internal pressure greater than 160 psig at 130 deg F	2.2	UN 1950	Nonflammable Gas	--	1,3	1,3	
	(3) more than 45% by weight of total contents consisting of flammable liquid. This limit is reduced to 35% if there is any flammable gas present	3.1	UN 1950	Flammable Liquid	--	1,3	1,3	
		3.2	UN 1950	Flammable Liquid	--	1,3	1,3	
		3.3	UN 1950	Flammable Liquid	--	1,3	1,3	
	(4) more than 10% by weight of toxic substances in the liquid concentrate	6.1	UN 1950	Poison	I/II	1,3	1,3	
		6.1		St. Andrews Cross	III	1,3	1,3	
	(5) more than 5% by weight of corrosive substances in the liquid concentrate	8	UN 1950	Corrosive	--	1,2	1,3	
	(6) as specified under Group 2 on page 9011 of IMCO Code	9	UN 1950	None	--			
N	Aerosol dispensers, *with a capacity of 1400 cubic cm. or more*	2	UN 1950		--			
	Agents, blasting, Type B. *See* Explosives, blasting, Type B							
	Agents, blasting, Type E. *See* Explosives, blasting, Type E							

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	Air, *compressed*	2.2	UN 1002	Nonflammable Gas	..	1,2	1,2	
	Aircraft thrust device *for assisted take-off*	4.1	UN 2791	Flammable Solid	II	1,2	5	
	Air, *refrigerated liquid*	2.2	UN 1003	Nonflammable Gas, Oxidizer	..	1,3	1,3	Stow 'separated from' acetylene. Do not overstow
N	Alarm devices, explosive *automatic*	1.4 S	UN 0001	None. Package to be marked '1.4 S'	..	1,3	1,3	
	Alcohols, n.o.s.	3.1	UN 1987	Flammable Liquid	I/II	1,3	5	Keep cool
		3.2	UN 1987	Flammable Liquid	II	1,2	1	
		3.3	UN 1987	Flammable Liquid	II	1,2	1,2	
	Alcohols, toxic, n.o.s.	3.1	UN 1986	Flammable Liquid, Poison	I/II	1,3	5	Keep cool
		3.2	UN 1986	Flammable Liquid, Poison	II	1,2	1	
		3.3	UN 1986	Flammable Liquid, Poison	II	1,2	1,2	
	Aldehydes, n.o.s.	3.1	UN 1989	Flammable Liquid	I/II	1,3	5	Keep cool
		3.2	UN 1989	Flammable Liquid	II	1,2	1	
		3.3	UN 1989	Flammable Liquid	II	1,2	1,2	
	Aldehydes, toxic, n.o.s.	3.1	UN 1988	Flammable Liquid, Poison	I/II	1,3	5	Keep cool
		3.2	UN 1988	Flammable Liquid, Poison	II	1,2	1	
		3.3	UN 1988	Flammable Liquid, Poison	II	1,2	1,2	
	Aldol	6.1	UN 2839	Poison	II	1,3	1,3	Keep cool. Shade from radiant heat. Stow 'away from' living quarters
	Alkali metal alloys, liquid	4.3	UN 1421	Dangerous When Wet	I	1,2	5	
	Alkali metal amalgams, n.o.s.	4.3	UN 1389	Dangerous When Wet	I	1,2	1,2	
	Alkali metal amides, n.o.s.	4.3	UN 1390	Dangerous When Wet	II	1,2	5	
	Alkali metal dispersions, n.o.s. *or* Alkali earth metal dispersions, n.o.s.	4.3	UN 1391	Dangerous When Wet	I	1,2	5	
	Alkaline caustic liquids, n.o.s. *See* Caustic alkali liquids, n.o.s.							
	Alkaline corrosive liquids, n.o.s. *See* Corrosive liquids, n.o.s.							
	Alkaline earth metal alloys, n.o.s.	4.3	UN 1393	Dangerous When Wet	II	1,2	5	
	Alkaline earth metal amalgams, n.o.s.	4.3	UN 1392	Dangerous When Wet	I	1,2	1,2	
	Alkaloids, n.o.s. *or* Alkaloid salts, n.o.s., *poisonous*	6.1	UN 1544	Poison	I/II	1,2	1,2	
		6.1	UN 1544	St. Andrews Cross	III	1,2	1,2	
	Alkylamines and polyamines, *flashpoint below 23 deg C and boiling point above 35 deg C but not more than 200 deg C*, n.o.s.	3.2	UN 2733	Flammable Liquid, Corrosive	II	1,2	1	
	Alkylamines and polyamines, *flashpoint 23 deg C or above, boiling point above 35 deg C but not more than 200 deg C*, n.o.s.	8	UN 2734	Corrosive, Flammable Liquid (only if flashpoint 61 deg C or below)	II	1,2	1,2	If flashpoint 61 deg C or below, segregation same as for flammable liquids
	Alkylamines and polyamines, *flashpoint of 23 deg C or above and boiling point above 200 deg C*, n.o.s.	8	UN 2735	Corrosive, Flammable Liquid (only if flashpoint 61 deg C or below)	III	1,2	1,2	If flashpoint 61 deg C or below, segregation same as for flammable liquids
	Alkyl, Aryl *or* Toluene sulphonic acid, liquid, *containing more than 5% free sulphuric acid*	8	UN 2584	Corrosive	II	1,2	1	Glass carboys not permitted under deck

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Optional Hazardous Materials Table—Continued

(1) Notes and Symbols	(2) Hazardous Materials Description and Proper Shipping Names	(3) IMO Class	(4) Identification Number	(5) Label(s) required	(6) Packaging Group	(7) Vessel Stowage Requirements (a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Alkyl, Aryl *or* Toluene sulphonic acid, liquid, *containing not more than 5% free sulphuric acid*	8	UN 2586	Corrosive	III	1,2	1	Glass carboys not permitted under deck
	Alkyl, Aryl *or* Toluene sulphonic acid, solid, *containing more than 5% free sulphuric acid*	8	UN 2583	Corrosive	II	1,2	1,2	Keep dry
	Alkyl, Aryl *or* Toluene sulphonic acid, solid, *containing not more than 5% free sulphuric acid*	8	UN 2585	Corrosive	III	1,2	1,2	Keep dry
	Alkyl phenols, n.o.s	6.1	UN 2430	St. Andrews Cross	III	1,2	1,2	
	Allyl acetate	3.2	UN 2333	Flammable Liquid, Poison	II	1,3	5	Keep cool
	Allyl alcohol	3.2	UN 1098	Flammable Liquid, Poison	I	1,2	1	
	Allylamine	3.1	UN 2334	Flammable Liquid, Poison	I	1,3	5	Keep cool
	Allyl bromide	3.2	UN 1099	Flammable Liquid, Poison	I	1,2	1	
	Allyl chloride	3.1	UN 1100	Flammable Liquid, Poison	I	1,3	5	Keep cool
	Allyl chlorocarbonate *See* Allyl chloroformate							
	Allyl chloroformate	8	UN 1722	Corrosive, Flammable Liquid	I	1	5	Keep dry. Stow 'separated longitudinally by an intervening complete compartment or hold from' explosives. Segregation same as for flammable liquids
	Allyl ethyl ether	3.2	UN 2335	Flammable Liquid, Poison	II	1,3	5	Keep cool
	Allyl formate	3.2	UN 2336	Flammable Liquid, Poison	I	1,3	5	Keep cool
	Allyl glycidyl ether	3.3	UN 2219	Flammable Liquid	III	1,2	1,2	
	Allyl iodide	3.2	UN 1723	Flammable Liquid, Corrosive	I	1,2	1	
	Allyl isothiocyanate, *stabilized*	6.1	UN 1545	Poison, Flammable Liquid	II	1	5	Shade from radiant heat. Stow 'away from' living quarters. Segregation same as for flammable liquids
	Allyl trichlorosilane, *stabilized*	8	UN 1724	Corrosive, Flammable Liquid	II	1	1	Keep dry. Stow 'separated longitudinally by an intervening complete compartment or hold from' explosives. Segregation same as for flammable liquids

Aluminium alkyl halides, *in solution*	4.2	UN 2220	Spontaneously Combustible	II	1	1	
Aluminium alkyl halides, *pure*	4.2	UN 2221	Spontaneously Combustible	I	1	5	
Aluminium alkyls. *See* Metal alkyls, n.o.s.							
Aluminium borohydride *or* Aluminium borohydride in devices	4.2	UN 2870	Spontaneously Combustible, Dangerous When Wet	I	1	5	
Aluminium bromide, anhydrous	8	UN 1725	Corrosive	II	1,2	1,2	Keep dry
Aluminium bromide solution	8	UN 2580	Corrosive	III	1,2	1,2	
Aluminium carbide	4.3	UN 1394	Dangerous When Wet	II	1,2	1,2	
Aluminium chloride, anhydrous	8	UN 1726	Corrosive	II	1,2	1,2	Keep dry
Aluminium chloride solution	8	UN 2581	Corrosive	III	1,2	1,2	
Aluminium ferrosilicon, *powder*	4.3	UN 1395	Dangerous When Wet	II	1,2	1,2	
Aluminium hydride	4.2	UN 2463	Spontaneously Combustible	I	1,2	5	
Aluminium nitrate	5.1	UN 1438	Oxidizer	III	1,2	1,2	
Aluminium phosphide	4.3	UN 1397	Dangerous When Wet, Poison	I	1	1,2	
Aluminium powder, coated	4.1	UN 1309	Flammable Solid	III	1,2	1,2	Keep dry. Stow 'away from' liquid halogenated hydrocarbons
Aluminium, powder, pyrophoric. *See* Pyrophoric metals							
Aluminium, powder, uncoated, *non-pyrophoric*	4.3	UN 1396	Dangerous When Wet	II	1,2	1,2	Stow 'away from' liquid halogenated hydrocarbons
Aluminium resinate	4.1	UN 2715	Flammable Solid	III	1,2	1,2	
Aluminium silicon, *powder, uncoated*	4.3	UN 1398	Dangerous When Wet	III	1,2	1,2	
2-Amino-4-chlorophenol	6.1	UN 2673	Poison	II	1,2	1,2	
2-Amino-5-diethylaminopentane	6.1	UN 2946	St. Andrews Cross	III	1,2	1,2	
N-Aminoethylpiperazine	8	UN 2815	Corrosive	III	1,3	1,3	Keep cool
Aminophenols (*o-, m-, p-*)	6.1	UN 2512	St. Andrews Cross	III	1,2	1,2	
Aminopyridines (*o-, m-, p-*)	6.1	UN 2671	Poison	II	1,3	1	Keep cool. Stow 'away from' living quarters
Ammonia, *anhydrous, liquefied, or ammonia solutions, density (specific gravity) less than 0.880 at 15 degrees C. in water, containing more than 50% ammonia*	2.3	UN 1005	Poison Gas	--	1,2	5	Stow 'separated from' chlorine. Stow 'away from' living quarters
Ammonia solutions *density (specific gravity) between 0.880 and 0.957 at 15 deg C. in water, with more than 10% and not more than 35% ammonia, by weight*	8	UN 2672	Corrosive	III	1,2	1,2	Stow 'away from' living quarters
Ammonia solutions, *density (specific gravity) less than 0.880 at 15 degrees C. in water, containing more than 35% and not more than 50% ammonia*	2.2	UN 2373	Nonflammable Gas	--	1,2	5	Stow 'separated from' chlorine. Stow 'away from' living quarters
Ammonium arsenate	6.1	UN 1546	Poison	II	1,2	1,2	Stow 'away from' alkalis
Ammonium bifluoride. *See* Ammonium hydrogen fluoride							
Ammonium dichromate	5.1	UN 1439	Oxidizer	II	1,2	1,2	Stow 'away from' foodstuffs
Ammonium dinitro-o-cresolate	6.1	UN 1843	Poison	II	1,2	1	Stow 'away from' heavy metals, 'separated from' flammable substances and 'separated longitudinally by an intervening complete compartment or hold from' explosives

Optional Hazardous Materials Table—Continued

(1) Notes and Symbols	(2) Hazardous Materials Description and Proper Shipping Names	(3) IMO Class	(4) Identification Number	(5) Label(s) required	(6) Packaging Group	(7) Vessel Stowage Requirements (a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Ammonium fluoride	6.1	UN 2505	St. Andrews Cross	III	1,2	1,2	Stow 'away from' acids
	Ammonium hydrogen fluoride, solid	8	UN 1727	Corrosive	II	1,2	1,2	Keep dry
	Ammonium hydrogen fluoride, solution	8	UN 2817	Corrosive, Poison	II	1,2	1	
	Ammonium hydrogen sulphate	8	UN 2506	Corrosive	II	1,2	1,2	Stow 'away from' strong alkalis
	Ammonium metavanadate	6.1	UN 2859	Poison	II	1,2	1,2	Stow 'away from' living quarters
	Ammonium nitrate fertilizers, n.o.s.	5.1	UN 2072	Oxidizer	II	1,3	1,3	Stow 'away from' sources of heat and 'separated from' combustible material, chlorates, hypochlorites, nitrites, permanganates, and metalic powders
	Ammonium nitrate fertilizers, *of the same composition as defined in class 5.1 on pages 5015 and 5016 of the IMCO Code but containing greater amounts of organic and/or combustible material than specified in these entries*	1.1 D	UN 0223	Explosive (1.1D)	—	1,2	1,2	
	Ammonium nitrate fertilizers, *Type A*							
	(1) Uniform non-segregating mixtures of ammonium nitrate with added matter which is inorganic and chemically inert towards ammonium nitrate, containing not less than 90% of ammonium nitrate and not more than 0.2% of combustible material (including organic material calculated as carbon), or containing less than 90% but more than 70% of ammonium nitrate and not more than 0.4% of total combustible material	5.1	UN 2067	Oxidizer	III	1,3	1,3	Stow 'away from' sources of heat and 'separated from' combustible material, chlorates, hypochlorites, nitrites, permanganates, and metalic powders
	(2) Uniform non-segrating mixtures of ammonium nitrate with calcium carbonate and/or dolomite, containing more than 80% but less than 90% of ammonium nitrate and not more than 0.4% of total combustible material	5.1	UN 2068	Oxidizer	III	1,3	1,3	Stow 'away from' sources of heat and 'separated from' combustible material, chlorates, hypochlorites, nitrites, permanganates, and metalic powders
	(3) Uniform non-segregating mixtures of ammonium nitrate/ammonium sulphate, containing more than 45% but not more than 70% of ammonium nitrate and containing not more than 0.4% of total combustible material	5.1	UN 2069	Oxidizer	III	1,3	1,3	Stow 'away from' sources of heat and 'separated from' combustible material, chlorates, hypochlorites, nitrites, permanganates, and metalic powders
	(4) Uniform non-segregating mixtures of nitrogen/phosphate or nitrogen/potash types or complete fertilizers of nitrogen/phosphate/potash type, containing more than 70% but less than 90% of ammonium nitrate and not more than 0.4% of total combustible material	5.1	UN 2070	Oxidizer	III	1,3	1,3	Stow 'away from' sources of heat and 'separated from' combustible material, chlorates, hypochlorites, nitrites, permanganates, and metalic powders

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	Ammonium nitrate fertilizers, *Type B. Uniform non-segregating mixtures of nitrogen/phosphate or nitrogen/potash types or complete fertilizers of nitrogen/phosphate/potash type, containing not more than 70% of ammonium nitrate and not more than 0.4% of total added combustible material or containing not more than 45% of ammonium nitrate with unrestricted combustible material*	9	UN 2071	None	III	1,2	1,2	
	Ammonium nitrate, *with more than 0.2% by weight of combustible substances, including any organic substance calculated as carbon, to the exclusion of any other added substance*	1.1 D	UN 0222	Explosive (1.1D)	--	1,2	1,2	
	Ammonium nitrate, *with not more than 0.2% of combustible substance including any organic substance calculated as carbon, to the exclusion of any other add substance*	5.1	UN 1942	Oxidizer	III	1,3	1,3	Stow 'away from' sources of heat and 'separated from' combustible material, chlorates, hypochlorites, nitrites, permanganates, and metalic powders
	Ammonium perchlorate	5.1	UN 1442	Oxidizer	II	1,2	5	Stow 'away from' powdered metals
N	Ammonium perchlorate, *average particle size less than 45 microns*	1.1D	UN 0402	Explosive (1.1D)	--	--	--	
	Ammonium persulphate	5.1	UN 1444	Oxidizer	III	1,2	1,2	
N	Ammonium picrate, *dry or wetted with less than 10% water, by weight*	1.1D	UN 0004	Explosive (1.1D)	--	--	--	
	Ammonium picrate, wetted, *with not less than 10% water, by weight*	4.1	UN 1310	Flammable Solid	I	1	5	Stow 'away from' heavy metals and their compounds
	Ammonium picrate, wetted, *with not less than 33 1/3 % water, by weight*	4.1	UN 1310	Flammable Solid	I	1,2	5	Stow 'away from' heavy metals and their compounds
	Ammonium polysulphide, solution	8	UN 2818	Corrosive, Poison	II	1,3	1	Keep cool. Stow 'away from' acids
	Ammonium polyvanadate	6.1	UN 2861	Poison	II	1,2	1,2	Stow 'away from' living quarters
	Ammonium silicofluoride	6.1	UN 2854	St. Andrews Cross	III	1,2	1,2	Stow 'away from' acids
	Ammonium sulphide, solution	8	UN 2683	Corrosive, Poison, Flammable Liquid (only if flashpoint below 61 deg C)	II	1,3	1	Keep cool. Stow 'away from' all other corrosives. If flashpoint below 61 deg C, segregation same as for flammable liquids
	Ammunition, illuminating, *with or without burster, expelling charge or propelling charge*	1.4 G	UN 0297	Explosive (1.4G)	--	1,3	1,3	
N	Ammunition, illuminating, *with or without burster, expelling charge or propelling charge*	1.2G	UN 0171	Explosive (1.2G)	--	--	--	
N	Ammunition, illuminating, *with or without burster, expelling charge or propelling charge*	1.3G	UN 0254	Explosive (1.3G)	--	--	--	
N	Ammunition, incendiary, *liquid or gel, with burster, expelling charge or propelling charge*	1.3J	UN 0247	Explosive (1.3J)	--	--	--	
	Ammunition, incendiary *(other than water-activated ammunition), without white phosphorus or phosphides, with or without burster, expelling charge or propelling charge*	1.4 G	UN 0300	Explosive (1.4G)	--	1,3	1,3	
N	Ammunition, incendiary *(other than water-activated ammunition), without white phosphorus or phosphides, with or without burster, expelling charge or propelling charge*	1.2G	UN 0009	Explosive (1.2G)	--	--	--	
N	Ammunition, incendiary *(other than water-activated ammunition), without white phosphorus or phosphides, with or without burster, expelling charge or propelling charge*	1.3G	UN 0010	Explosive (1.3G)	--	--	--	
N	Ammunition, incendiary, white phosphorus, *with burster, expelling charge or propelling charge*	1.2H	UN 0243	Explosive (1.2H)	--	--	--	
N	Ammunition, incendiary, white phosphorus, *with burster, expelling charge or propelling charge*	1.3H	UN 0244	Explosive (1.3H)	--	--	--	
	Ammunition, practice	1.4G	UN 0362	Explosive (1.4G)	--	1,3	1,3	

Optional Hazardous Materials Table—Continued

(1) Notes and Symbols	(2) Hazardous Materials Description and Proper Shipping Names	(3) IMO Class	(4) Identification Number	(5) Label(s) required	(6) Packaging Group	(7) Vessel Stowage Requirements (a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Ammunition, proof	1.4G	UN 0363	Explosive (1.4G)	–	1,3	1,3	
N	Ammunition, smoke *(other than water-activated ammunition) without white phosphorus or phosphides, with or without burster, expelling charge or propelling charge*	1.2G	UN 0015	Explosive (1.2G), Corrosive	–	–	–	
N	Ammunition, smoke *(other than water-activated ammunition) without white phosphorus or phosphides, with or without burster, expelling charge or propelling charge*	1.3G	UN 0016	Explosive (1.3G), Corrosive	–	–	–	
N	Ammunition, smoke *(other than water-activated ammunition) without white phosphorus or phosphides, with or without burster, expelling charge or propelling charge*	1.4G	UN 0303	Explosive (1.4G), Corrosive	–	–	–	
N	Ammunition, smoke, white phosphorus *(other than water-activated ammunition), with burster, expelling charge or propelling charge*	1.2H	UN 0245	Explosive (1.2H)	–	–	–	
N	Ammunition, smoke, white phosphorus *(other than water-activated ammunition), with burster, expelling charge or propelling charge*	1.3H	UN 0246	Explosive (1.3H)	–	–	–	
	Ammunition, tear producing, non-explosive, *with neither burster nor expelling charge, non-fuzed*	6.1	UN 2017	Poison, Corrosive	II	1,2	5	Keep dry. Stow 'away from' living quarters. Segregation same as for corrosives
N	Ammunition, tear producing, *with burster, expelling charge or propelling charge*	1.2G	UN 0018	Explosive (1.2G), Poison, Corrosive	–	–	–	
N	Ammunition, tear producing, *with burster, expelling charge or propelling charge*	1.3G	UN 0019	Explosive (1.3G), Poison, Corrosive	–	–	–	
	Ammunition, tear-producing, *with burster, expelling charge or propelling charge*	1.4 G	UN 0301	Explosive (1.4G), Poison, Corrosive	–	1,3	1,3	
	Ammunition, toxic, *non-explosive, with neither burster nor expelling charge, non-fuzed*	6.1	UN 2016	Poison	II	1,2	5	Keep dry
N	Ammunition, toxic *(other than water-activated ammunition) with burster, expelling charge or propelling charge*	1.2K	UN 0020	Explosive (1.2K), Poison	–	–	–	
N	Ammunition, toxic *(other than water-activated ammunition) with burster, expelling charge or propelling charge*	1.3K	UN 0021	Explosive (1.3K), Poison	–	–	–	
	Amyl acetates	3.2 3.3	UN 1104 UN 1104	Flammable Liquid Flammable Liquid	II II	1,2 1,2	1 1,2	
	Amyl acid phosphate	8	UN 2819	Corrosive	III	1,2	1,2	
	Amyl alcohols	3.2 3.3	UN 1105 UN 1105	Flammable Liquid Flammable Liquid	II II	1,2 1,2	1 1,2	
	Amylamine	3.2	UN 1106	Flammable Liquid	II	1,2	1	
	Amyl butyrates	3.3	UN 2620	Flammable Liquid	III	1,2	1,2	

Amyl chloride	3.2	UN 1107	Flammable Liquid	II	1,2	1	
n-Amylene	3.1	UN 1108	Flammable Liquid	I	1,3	5	Keep cool
Amyl formates	3.3	UN 1109	Flammable Liquid	II	1,2	1,2	
Amyl mercaptan	3.2	UN 1111	Flammable Liquid	II	1,2	1	
Amyl methyl ketone	3.3	UN 1110	Flammable Liquid	III	1,2	1,2	
Amyl nitrate	3.3	UN 1112	Flammable Liquid	II	1,3	5	
Amyl nitrite	3.1	UN 1113	Flammable Liquid	II	1,3	5	Keep cool
tert-Amyl peroxy-2-ethylhexanoate, *technical pure*	5.2	UN 2898	Organic Peroxide	II	1	5	Control temperature 20 deg C. Emergency temperature 25 deg C
tert-Amyl peroxyneodecanoate *with at least 25% phlegmatizer*	5.2	UN 2891	Organic Peroxide	II	1	5	Control temperature 0 deg C. Emergency temperature 10 deg C
tert-Amyl peroxypivalate *maximum concentration 77% in solution*	5.2	UN 2957	Organic Peroxide	II	1	5	Control temperature 10 deg C. Emergency temperature 15 deg C
Amyl trichlorosilane	8	UN 1728	Corrosive	II	1	1	Keep dry. Stow 'separated longitudinally by an intervening complete compartment or hold from' explosives
Aniline	6.1	UN 1547	Poison	II	1,2	1,2	Stow 'away from' acids and oxidizers
Aniline hydrochloride	6.1	UN 1548	St. Andrews Cross	III	1,2	1,2	Stow 'away from' alkalis
Aniline oil. *See* Aniline							
o-Anisidine	6.1	UN 2431	St. Andrews Cross	III	1,2	1,2	
Anisole	3.3	UN 2222	Flammable Liquid	III	1,2	1,2	
Anisoyl chloride	8	UN 1729	Corrosive	II	1	1	Keep dry. Glass carboys prohibited on passenger vessels
Anti-freeze. *See* Flammable liquid preparations, n.o.s.							
Antimony chloride. *See* Antimony trichloride, *liquid or solid*							
Antimony compounds, inorganic, n.o.s.	6.1 6.1	UN 1549 UN 1549	Poison St. Andrews Cross	I/II III	1,2 1,2	1,2 1,2	
Antimony lactate	6.1	UN 1550	St. Andrews Cross	III	1,2	1,2	
Antimony pentachloride, *liquid*	8	UN 1730	Corrosive	II	1	1	Keep dry. Glass carboys prohibited on passenger vessels
Antimony pentachloride, *solutions*	8	UN 1731	Corrosive	II	1	1	Glass carboys prohibited on passenger vessels
Antimony pentafluoride	8	UN 1732	Corrosive, Poison	II	1	5	Keep dry
Antimony potassium tartrate	6.1	UN 1551	St. Andrews Cross	III	1,2	1,2	
Antimony powder	6.1	UN 2871	St. Andrews Cross	III	1,2	1,2	
Antimony trichloride, *liquid*	8	UN 1733	Corrosive	II	1	1	Keep dry
Antimony trichloride, *solid*	8	UN 1733	Corrosive	II	1,2	1,2	Keep dry
Argon, *compressed*	2.2	UN 1006	Nonflammable Gas	--	1,3	1,3	
Argon, refrigerated liquid	2.2	UN 1951	Nonflammable Gas	--	1,3	1	
Arsenic acid, liquid	6.1	UN 1553	Poison	I	1,2	1,2	
Arsenic acid, solid	6.1	UN 1554	Poison	II	1,2	1,2	
Arsenical dust	6.1	UN 1562	Poison	II	1,2	1,2	
Arsenical flue dust. *See* Arsenical dust							

Optional Hazardous Materials Table—Continued

(1)	(2)	(3)	(4)	(5)	(6)	(7)		
						Vessel Stowage Requirements		
Notes and Symbols	Hazardous Materials Description and Proper Shipping Names	IMO Class	Identification Number	Label(s) required	Packaging Group	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Arsenical pesticides, liquid, flammable, toxic, n.o.s., *flashpoint less than 23 deg C*	3.2	UN 2760	Flammable Liquid and Poison or St. Andrews Cross (according to toxicity)	I/II	1,2	1	
	Arsenical pesticides, liquid, toxic, flammable, n.o.s. *flashpoint between 23 deg C and 61 deg C*	6.1	UN 2993	Poison, Flammable Liquid	I	1	1	Segregation same as for flammable liquids
		6.1	UN 2993	Poison, Flammable Liquid	II	1,2	1	Segregation same as for flammable liquids
		6.1	UN 2993	St. Andrews Cross, Flammable Liquid	III	1,2	1,2	Segregation same as for flammable liquids
	Arsenical pesticides, liquid, toxic, n.o.s.	6.1	UN 2994	Poison	I	1	1	
		6.1	UN 2994	Poison	II	1,2	1	
		6.1	UN 2994	St. Andrews Cross	III	1,2	1,2	
	Arsenical pesticides, solid, toxic, n.o.s.	6.1	UN 2759	Poison	I/II	1,2	1,2	
		6.1	UN 2759	St. Andrews Cross	III	1,2	1,2	
	Arsenic bromide	6.1	UN 1555	Poison	II	1,2	1,2	Keep cool. Stow 'away from' living quarters
	Arsenic chloride. *See* Arsenic trichloride							
	Arsenic compounds, liquid, n.o.s.	6.1	UN 1556	Poison, Flammable Liquid (if flashpoint between 23 deg C and 61 deg C)	I/II	1,2	1	
		6.1	UN 1556	St. Andrews Cross, Flammable Liquid (if flashpoint between 23 deg C and 61 deg C)	III	1,2	1	
	Arsenic compounds, solid, n.o.s.	6.1	UN 1557	Poison	I	1,2	1	
		6.1	UN 1557	Poison	II	1,2	1,2	
		6.1	UN 1557	St. Andrews Cross	III	1,2	1,2	
	Arsenic, *metallic*	6.1	UN 1558	Poison	II	1,2	1,2	
	Arsenic pentoxide	6.1	UN 1559	Poison	II	1,2	1,2	
	Arsenic sulphides, solid, n.o.s. *See* Arsenic compounds, solid, n.o.s.							
	Arsenic trichloride	6.1	UN 1560	Poison	I	1,2	1,2	
	Arsenic trioxide	6.1	UN 1561	Poison	II	1,2	1,2	

	Arsine	2 3	UN 2188	Poison Gas, Flammable Gas	--	1	5	Stow 'away from' living quarters
	Articles, explosive, n o s	1 4B	UN 0350	Explosive (1 4B)	--	1,3	1,3	
	Articles, explosive, n o s	1 4C	UN 0351	Explosive (1 4C)	--	1,3	1,3	
	Articles, explosive, n o s	1 4D	UN 0352	Explosive (1 4D)	--	1,3	1,3	
	Articles, explosive, n o s	1 4G	UN 0353	Explosive (1 4G)	--	1,3	1,3	
	Articles, explosive, n o s	1 4S	UN 0349	None Package to be marked '1 4S'	--	1,3	1,3	
N	Articles, explosive, n o s	1.1L	UN 0354	Explosive (1.1L)	--	--	--	
N	Articles, explosive, n o s	1.2L	UN 0355	Explosive (1.2L)	--	--	--	
N	Articles, explosive, n o s	1.3L	UN 0356	Explosive (1.3L)	--	--	--	
N	Articles, pyrophoric	1.2L	UN 0380	Explosive (1.2L)	--	--	--	
	Asbestos, blue	9	UN 2212	None	II	1,2	1,2	
	Asbestos, white	9	UN 2590	None	III	1,2	1,2	
	Asphalt cut-backs *See* Cut-backs, *asphalt or bitumen*							
	2,2'-Azodi-(2,4-dimethyl-4-methoxyvaleronitrile)	4.1	UN 2955	Flammable Solid	II	1	1	Control temperature −5 deg C. Emergency temperature 5 deg C
	2,2'-Azodi-(2,4-dimethylvaleronitrile)	4.1	UN 2953	Flammable Solid	II	1	1	Control temperature 10 deg C. Emergency temperature 15 deg C
	Azodi-(1 1'-hexahydrobenzonitrile)	4.1	UN 2954	Flammable Solid	II	1,2	1	Shade from radiant heat
	Azodiisobutyronitrile	4.1	UN 2952	Flammable Solid	II	1	5	Control temperature 40 deg C. Emergency temperature 45 deg C
	Bags, *empty and unwashed, having contained* Potassium nitrate *or* sodium nitrate	4.1	UN 1359	Flammable Solid	III	1,2	5	
	Barium, *alloys, non-pyrophoric*	4.3	UN 1399	Dangerous When Wet	II	1,2	5	
	Barium alloys, pyrophoric	4.2	UN 1854	Spontaneously Combustible	II	1	5	
N	Barium azide, *dry or containing, by weight, less than 50% water*	1.1A	UN 0224	Explosive (1.1A), Poison	--	--	--	
	Barium azide, wetted *with not less than 50% water, by weight*	4.1	UN 1571	Flammable Solid, Poison	I	1	5	Stow 'away from' heavy metals
	Barium bromate	5.1	UN 2719	Oxidizer, Poison	II	1,2	1,2	Stow 'separated from' ammonium compounds and 'away from' finely powdered metals and foodstuffs
	Barium chlorate	5.1	UN 1445	Oxidizer, Poison	II	1,2	1,2	Stow 'away from' powdered metals, 'separated from' Ammonium compounds
	Barium compounds, n.o.s	6.1 6.1	UN 1564 UN 1564	Poison St. Andrews Cross	I/II III	1,2 1,2	1,2 1,2	
	Barium cyanide	6.1	UN 1565	Poison	I	1,2	1,2	Stow 'away from' acids
	Barium hypochlorite, *with more than 22% available chlorine*	5.1	UN 2741	Oxidizer, Poison	II	1,2	1,2	Stow 'away from' foodstuffs
	Barium, *metal, non-pyrophoric*	4.3	UN 1400	Dangerous When Wet	II	1,2	5	
	Barium nitrate	5.1	UN 1446	Oxidizer, Poison	II	1,2	1,2	
	Barium oxide	6.1	UN 1884	St. Andrews Cross	III	1,2	1,2	
	Barium perchlorate	5.1	UN 1447	Oxidizer, Poison	II	1,2	1,2	Stow 'away from' powdered metals
	Barium permanganate	5.1	UN 1448	Oxidizer, Poison	II	1,2	1,2	Stow 'separated from' ammonium compounds and hydrogen peroxide

Optional Hazardous Materials Table—Continued

(1)	(2)	(3)	(4)	(5)	(6)	(7) Vessel Stowage Requirements		
Notes and Symbols	Hazardous Materials Description and Proper Shipping Names	IMO Class	Identification Number	Label(s) required	Packaging Group	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Barium peroxide	5.1	UN 1449	Oxidizer, Poison	II	1,2	1,2	Keep dry
	Batteries, wet, filled with acid, *electric, storage*	8	UN 2794	Corrosive	III	1,2	1,2	
	Batteries, wet, filled with alkali, *electric, storage*	8	UN 2795	Corrosive	III	1,2	1,2	
	Batteries, wet, non-spillable, *electric, storage*	8	UN 2800	None. Package to be marked 'Class 8'	III	1,2	1,2	
	Battery fluid, acid	8	UN 2796	Corrosive	II	1,2	1	Stow 'away from' fluorides. Glass carboys in hampers prohibited under deck
	Battery fluid, alkali	8	UN 2797	Corrosive	II	1,2	1,2	
	Benzene	3.2	UN 1114	Flammable Liquid	II	1,2	1	
	Benzene sulphonyl chloride	8	UN 2225	Corrosive	III	1,2	1,2	
	Benzidine	6.1	UN 1885	Poison	II	1,2	1,2	
	Benzine	3.1	UN 1115	Flammable Liquid	II	1,3	5	Keep cool
		3.2	UN 1115	Flammable Liquid	II	1,2	1	
		3.3	UN 1115	Flammable Liquid	III	1,2	1,2	
	Benzoic derivative pesticides, liquid, flammable, toxic, n.o.s. *flash-point less than 23 deg C*	3.2	UN 2770	Flammable Liquid and Poison or St. Andrews Cross (according to toxicity)	I/II	1,2	1	
	Benzoic derivative pesticides, liquid, toxic, flammable, n.o.s. *flash-point between 23 deg C and 61 deg C*	6.1	UN 3003	Poison, Flammable Liquid	I	1	1	Segregation same as for flammable liquids
		6.1	UN 3003	Poison, Flammable Liquid	II	1,2	1	Segregation same as for flammable liquids
		6.1	UN 3003	St. Andrews Cross, Flammable Liquid	III	1,2	1,2	Segregation same as for flammable liquids
	Benzoic derivative pesticides liquid, toxic, n.o.s.	6.1	UN 3004	Poison	I	1	1	
		6.1	UN 3004	Poison	II	1,2	1	
		6.1	UN 3004	St. Andrews Cross	III	1,2	1,2	
	Benzoic derivative pesticides, solid, toxic, n.o.s.	6.1	UN 2769	Poison	I/II	1,2	1,2	
		6.1	UN 2769	St. Andrews Cross	III	1,2	1,2	
	Benzonitrile	6.1	UN 2224	Poison	II	1,2	1,2	Stow 'away from' acids
	Benzoquinone	6.1	UN 2587	Poison	II	1,2	1,2	
	Benzotrichloride	8	UN 2226	Corrosive	II	1,2	1,2	Stow 'away from' living quarters
	Benzotrifluoride	3.2	UN 2338	Flammable Liquid	II	1,2	1	

Benzoyl chloride	8	UN 1736	Corrosive	II	1	1	Keep dry. Glass carboys prohibited on passenger vessels
Benzoyl peroxide, *in a concentration of more than 77% but less than 95% with water*	5.2	UN 2088	Organic Peroxide	I	1	5	
Benzoyl peroxide, *in a concentration of more than 72% but less than 95% as a paste*	5.2	UN 2086	Organic Peroxide	I	1	5	
Benzoyl peroxide, *in a concentration of not more than 72% as a paste*	5.2	UN 2087	Organic Peroxide	II	1	5	
Benzoyl peroxide, *in a concentration of not more than 77% with water*	5.2	UN 2090	Organic Peroxide	II	1	5	
Benzoyl peroxide, *in concentrations from 30% to maximum 52% with inert solid*	5.2	UN 2089	Organic Peroxide	II	1	5	
Benzoyl peroxide, *technical pure or in a concentration of more than 52% with inert solid*	5.2	UN 2085	Organic Peroxide	I	1	5	
Benzyl bromide	8	UN 1737	Corrosive	II	1	5	Keep dry
Benzyl chloride	6.1	UN 1738	Poison, Corrosive	II	1	5	Keep dry. Segregation same as for corrosives
Benzyl chloroformate	8	UN 1739	Corrosive	I	1	5	Keep dry
Benzyl dimethylamine	8	UN 2619	Corrosive, Flammable Liquid	II	1,3	1,3	Segregation same as for flammable liquids. Stow 'away from' sources of heat
Benzylidene chloride	6.1	UN 1886	Poison	II	1	5	
Benzyl iodide	6.1	UN 2653	Poison	II	1,3	1	Keep cool. Stow 'away from' living quarters
Beryllium compounds	6.1	UN 1566	Poison	II	1,2	1,2	
Beryllium, *metal powder*	6.1	UN 1567	Poison, Flammable Solid	II	1,2	1,2	Segregation same as for flammable solids
Beryllium nitrate	5.1	UN 2464	Oxidizer, Poison	II	1,2	1,2	Keep cool. If packaged in a liner within a wooden barrel, fiber drum or plywood drum or in plastic bags within a fiberboard box, stow 'away from' sources of heat
Bhusa	4.1	UN 1327	None	III	1,2	1,2	Stow 'away from' animal or vegetable oils
Bifluorides, n.o.s.	8	UN 1740	Corrosive	II	1,2	1,2	Keep dry
Bipyridilium pesticides, liquid, flammable, toxic, n.o.s., *flashpoint less than 23 deg C*	3.2	UN 2782	Flammable Liquid and Poison or St. Andrews Cross (according to toxicity)	I/II	1,2	1	
Bipyridilium pesticides, liquid, toxic, flammable, n.o.s., *flashpoint between 23 deg C and 61 deg C*	6.1	UN 3015	Poison, Flammable Liquid	I	1	1	Segregation same as for flammable liquids
	6.1	UN 3015	Poison, Flammable Liquid	II	1,2	1	Segregation same as for flammable liquids
	6.1	UN 3015	St. Andrews Cross, Flammable Liquid	III	1,2	1,2	Segregation same as for flammable liquids
Bipyridilium pesticides, liquid, toxic, n.o.s.	6.1	UN 3016	Poison	I	1	1	
	6.1	UN 3016	Poison	II	1,2	1	
	6.1	UN 3016	St. Andrews Cross	III	1,2	1,2	
Bipyridilium pesticides, solid, toxic, n.o.s.	6.1	UN 2781	Poison	I	1,2	1,2	
	6.1	UN 2781	Poison	II	1,2	1,2	
	6.1	UN 2781	St. Andrews Cross	III	1,2	1,2	

Optional Hazardous Materials Table—Continued

(1) Notes and Symbols	(2) Hazardous Materials Description and Proper Shipping Names	(3) IMO Class	(4) Identification Number	(5) Label(s) required	(6) Packaging Group	(7) Vessel Stowage Requirements (a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Bisulphites, inorganic, aqueous solution, n.o.s.	8	UN 2693	Corrosive	III	1,2	1,2	Stow 'away from' all other corrosive substances. Glass carboys prohibited on passenger vessels
N	Black powder, compressed	1.1D	UN 0028	Explosive (1.1D)	–	–	–	
N	Black powder, *granular or as meal*	1.1D	UN 0027	Explosive (1.1D)	–	–	–	
	Bleaching powder. *See* Calcium hypochlorite mixtures, dry, *with more than 10% but not more than 39% available chlorine*							
	Blue asbestos. *See* Asbestos, blue							
N	Bombs, containing flammable liquid, *with bursting charge*	1.1J	UN 0399	Explosive (1.1J)	–	–	–	
N	Bombs, containing flammable liquid, *with bursting charge*	1.2J	UN 0400	Explosive (1.2J)	–	–	–	
N	Bombs, photo-flash	1.1D	UN 0038	Explosive (1.1D)	–	–	–	
N	Bombs, photo-flash	1.1F	UN 0037	Explosive (1.1F)	–	–	–	
N	Bombs, photo-flash	1.2G	UN 0039	Explosive (1.2G)	–	–	–	
N	Bombs, photo-flash	1.3G	UN 0299	Explosive (1.3G)	–	–	–	
	Bombs, smoke, *containing a corrosive liquid, non-explosive, without initiating device*	8	UN 2028	Corrosive	II	1,2	5	Keep dry. Stow 'away from' living quarters
N	Bombs, *with bursting charge*	1.1D	UN 0034	Explosive (1.1D)	–	–	–	
N	Bombs, *with bursting charge*	1.2D	UN 0035	Explosive (1.2D)	–	–	–	
N	Bombs, *with bursting charge*	1.1F	UN 0033	Explosive (1.1F)	–	–	–	
N	Bombs, *with bursting charge*	1.2F	UN 0291	Explosive (1.2F)	–	–	–	
N	Boosters, with detonator	1.1B	UN 0225	Explosive (1.1B)	–	–	–	
N	Boosters, with detonator	1.2B	UN 0268	Explosive (1.2B)	–	–	–	
N	Boosters, *without detonator*	1.1D	UN 0042	Explosive (1.1D)	–	–	–	
N	Boosters, *without detonator*	1.2D	UN 0283	Explosive (1.2D)	–	–	–	
	Borate and chlorate, mixtures. *See* Chlorate and borate *mixtures*							
	Borneol	4.1	UN 1312	None. Package to be marked 'Class 4.1'	III	1,2	1,2	
	Boron tribromide	8	UN 2692	Corrosive	I	1	1	Keep cool and dry. Stow 'away from' foodstuffs
	Boron trichloride	2.2	UN 1741	Nonflammable Gas, Corrosive	–	1	5	Shade from radiant heat. Stow 'away from' foodstuffs and living quarters
	Boron trifluoride	2.3	UN 1008	Poison Gas	–	1	5	Stow 'away from' foodstuffs and living quarters
	Boron trifluoride acetic acid complex	8	UN 1742	Corrosive	II	1,2	1,2	

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	Boron trifluoride diethyletherate	4.3	UN 2604	Dangerous When Wet, Flammable Liquid, Corrosive	II	1	5	
	Boron trifluoride dihydrate	8	UN 2851	Corrosive	II	1,3	1	Keep cool
	Boron trifluoride dimethyl etherate	4.3	UN 2965	Dangerous When Wet, Flammable Liquid, Corrosive	II	1	5	
	Boron trifluoride propionic acid complex	8	UN 1743	Corrosive	II	1,2	1,2	
	Box toe gum. *See* Nitrocellulose							
	Brake fluid, ***hydraulic***	3.2 3.3	UN 1118 UN 1118	Flammable Liquid Flammable Liquid	II II	1,2 1,2	1 1,2	
	Bromates, inorganic, n.o.s.	5.1	UN 1450	Oxidizer	II	1,2	1,2	Stow 'away from' powdered metals and 'separated from' ammonium compounds
	Bromine, ***(and solutions)***	8	UN 1744	Corrosive, Poison	I	1	5	Keep cool
	Bromine chloride	2.3	UN 2901	Poison Gas, Oxidizer, Corrosive	--	1	5	Stow 'away from' combustible materials
	Bromine pentafluoride	5.1	UN 1745	Oxidizer, Poison, Corrosive	I	1	5	Keep dry. Shade from radiant heat
	Bromine trifluoride	5.1	UN 1746	Oxidizer, Poison, Corrosive	I	1	5	Keep dry. Shade from radiant heat
	Bromoacetic acid, ***solid***	8	UN 1938	Corrosive	II	1,2	1,2	Keep dry
	Bromoacetic acid, ***solution***	8	UN 1938	Corrosive	II	1,2	1,2	Glass carboys in hampers not permitted under deck
	Bromoacetone	6.1	UN 1569	Poison, Flammable Liquid	II	1	5	Segregation same as for flammable liquids. Stow 'away from' living quarters
	Bromoacetyl bromide	8	UN 2513	Corrosive	II	1	1	Glass carboys prohibited on passenger vessels
	Bromobenzene	3.3	UN 2514	Flammable Liquid	III	1,2	1,2	
	Bromobenzyl cyanides	6.1	UN 1694	Poison	I	1	5	Keep cool. Stow 'away from' living quarters
	2-Bromobutane	3.2	UN 2339	Flammable Liquid	II	1,2	1	
	Bromochloromethane	6.1	UN 1887	St. Andrews Cross	III	1,2	1,2	
	2-Bromoethyl ethyl ether	3.2	UN 2340	Flammable Liquid	II	1,2	1	
	Bromoform	6.1	UN 2515	St. Andrews Cross	III	1,3	1,3	Keep cool
	1-Bromo-3-methylbutane	3.2	UN 2341	Flammable Liquid	II	1,2	1	
	Bromomethylpropanes	3.2	UN 2342	Flammable Liquid	II	1,2	1	
	Bromomethylpropanes	3.3	UN 2342	Flammable Liquid	II	1,2	1,2	
	2-Bromopentane	3.2	UN 2343	Flammable Liquid	II	1,2	1	
	Bromopropanes	3.2	UN 2344	Flammable Liquid	II	1,2	1	
	Bromopropanes	3.3	UN 2344	Flammable Liquid	II	1,2	1,2	
	3-Bromopropyne	3.2	UN 2345	Flammable Liquid	II	1,2	1	
	Bromotrifluoroethylene	2.1	UN 2419	Flammable Gas	--	1,2	5	
	Bromotrifluoromethane	2.2	UN 1009	Nonflammable Gas	--	1,2	1,2	
	Brucine	6.1	UN 1570	Poison	II	1,2	1,2	
N	**Bursters,** ***explosive***	1.1D	UN 0043	Explosive (1.1D)	--	--	--	
	Butadiene, ***inhibited***	2.1	UN 1010	Flammable Gas	--	1,2	1	Stow 'away from' living quarters
	Butanedione	3.2	UN 2346	Flammable Liquid	II	1,2	1	

Optional Hazardous Materials Table—Continued

(1) Notes and Symbols	(2) Hazardous Materials Description and Proper Shipping Names	(3) IMO Class	(4) Identification Number	(5) Label(s) required	(6) Packaging Group	(7) Vessel Stowage Requirements (a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Butane *or* **butane mixtures**	2.1	UN 1011	Flammable Gas	–	1,2	1	
	sec-Butanol	3.3	UN 1120	Flammable Liquid	II	1,2	1,2	
	tert-Butanol	3.2	UN 1120	Flammable Liquid	II	1,2	1	
	Butanol	3.3	UN 1120	Flammable Liquid	II	1,2	1,2	
	Butene. *See* **Butylene**							
	Butoxyl	3.3	UN 2708	Flammable Liquid	III	1,2	1,2	
	Butyl acetates	3.2	UN 1123	Flammable Liquid	II	1,2	1	
	Butyl acid phosphate	8	UN 1718	Corrosive	III	1,2	1,2	Glass carboys in hampers prohibited under deck
	Butylacrylate, inhibited	3.3	UN 2348	Flammable Liquid	II	1,2	1,2	
	Butyl alcohol. *See* **Butanol**							
	sec-Butyl alcohol. *See* **sec-Butanol**							
	tert-Butyl alcohol. *See* **tert-Butanol**							
	n-Butylamine	3.2	UN 1125	Flammable Liquid	II	1,2	1	
	N-n-Butylaniline	6.1	UN 2738	Poison	II	1,2	1,2	Stow 'away from' living quarters
	Butyl benzenes	3.3	UN 2709	Flammable Liquid	III	1,2	1,2	
	n-Butyl bromide	3.3	UN 1126	Flammable Liquid	II	1,2	1,2	
	n-Butyl chloride. *See* **Chlorobutanes**							
	n-Butylchloroformate	6.1	UN 2743	Poison, Corrosive, Flammable Liquid	II	1,3	1,3	Keep cool and dry. Shade from radiant heat. Stow 'away from' living quarters. Segregation same as for flammable liquids
	tert-Butyl cumene peroxide. *See* **tert-Butyl cumyl peroxide**							
	tert-Butyl cumyl peroxide, *technical pure*	5.2	UN 2091	Organic Peroxide	II	1	5	
	tert-Butylcyclohexylchloroformate	6.1	UN 2747	St. Andrews Cross	III	1,3	1,3	Keep cool and dry. Shade from radiant heat.
	n-Butyl-4,4-di-(tert-butyl-peroxy) valerate, *maximum concentration 52% with inert solid*	5.2	UN 2141	Organic Peroxide	II	1	5	
	n-Butyl-4,4-di-(tert-butyl-peroxy) valerate, *technical pure*	5.2	UN 2140	Organic Peroxide	II	1	5	
	Butylene	2.1	UN 1012	Flammable Gas	–	1,2	1	
	Butyl ether. *See* **Dibutyl ethers**							
	n-Butyl formate	3.2	UN 1128	Flammable Liquid	II	1,2	1	
	tert-Butyl hydroperoxide, *in a concentration over 72% to maximum 90% with water*	5.2	UN 2094	Organic Peroxide	I	1	5	

tert-Butyl hydroperoxide, *maximum concentration 80% in di-tert-butyl peroxide and/or solvent*	5.2	UN 2092	Organic Peroxide, Flammable Liquid (only if flashpoint of solvent is 61 deg C. or below)	I	1	5	
tert-Butyl hydroperoxide, *maximum concentration 72% with water*	5.2	UN 2093	Organic Peroxide	II	1	5	
N-n-Butyl imidazole	6.1	UN 2690	Poison	II	1,2	1,2	Stow 'away from' living quarters
tert-Butyl isocyanate	3.2	UN 2484	Flammable Liquid, Poison	I	1	5	Keep cool. Stow 'away from' living quarters and sources of heat
n-Butyl isocyanate	3.2	UN 2485	Flammable Liquid, Poison	II	1	5	Keep cool. Stow 'away from' living quarters and sources of heat
Butyl mercaptan	3.2	UN 2347	Flammable Liquid	II	1,2	1	
n-Butyl methacrylate	3.3	UN 2227	Flammable Liquid	III	1,2	1,2	
Butyl methyl ether	3.2	UN 2350	Flammable Liquid	II	1,2	1	
tert-Butyl monoperoxymaleate, *maximum concentration 55% as a paste*	5.2	UN 2101	Organic Peroxide	II	1	5	
tert-Butyl monoperoxymaleate, *maximum concentration 55% in solution*	5.2	UN 2100	Organic Peroxide	II	1	5	
tert-Butyl monoperoxymaleate, *technical pure*	5.2	UN 2099	Organic Peroxide	II	1	5	
tert-Butyl monoperoxyphthalate, *technical pure*	5.2	UN 2105	Organic Peroxide	II	1	5	
Butyl nitrite	3.2	UN 2351	Flammable Liquid	II	1,2	1	
tert-Butyl peroxide. *See* Di-tert-butyl peroxide				--	--	--	
tert-Butyl peroxyacetate, *in a concentration of more than 52% to a maximum concentration of 76% in solution*	5.2	UN 2095	Organic Peroxide	II	1	5	
tert-Butyl peroxyacetate, *maximum concentration 52% in solution*	5.2	UN 2096	Organic Peroxide	II	1	5	
tert-Butyl peroxybenzoate, *maximum concentration 75% in solution*	5.2	UN 2098	Organic Peroxide	II	1	5	
tert-Butyl peroxybenzoate, *technical pure or in a concentration of more than 75% in solution*	5.2	UN 2097	Organic Peroxide	II	1	5	
tert-Butyl peroxybenzoate *with at least 50% inert inorganic solid*	5.2	UN 2890	Organic Peroxide	II	1	5	
tert-Butyl peroxycrotonate, *maximum concentration 76% in solution*	5.2	UN 2183	Organic Peroxide	II	1	5	
n-Butyl peroxydicarbonate, *in a concentration of more than 27% to a maximum concentration of 52% in solution*	5.2	UN 2169	Organic Peroxide	II	1	5	Control temperature -15 deg C. Emergency temperature -5 deg C
n-Butyl peroxydicarbonate, *maximum concentration 27% in solution*	5.2	UN 2170	Organic Peroxide	II	1	5	Control temperature 0 dec C. Emergency temperature 10 deg C
tert-Butyl peroxydiethylacetate, *(in a maximum concentration of 33%)*, with tert-butyl peroxybenzoate, *(in a maximum concentration of 33%), and with solvent*	5.2	UN 2551	Organic Peroxide	I/II	1	5	
tert-Butyl peroxydiethylacetate, *technical pure*	5.2	UN 2144	Organic Peroxide	II	1	5	Control temperature 20 deg C. Emergency temperature 25 deg C
tert-Butyl peroxy-2-ethylhexanoate, *maximum concentration 30%* with 2,2-di-(tert-butyl peroxy) butane *maximum concentration 35% and with at least 35% phlegmatizer*	5.2	UN 2886	Organic Peroxide	II	1	5	Control temperature 35 deg C. Emergency temperature 40 deg C
tert-Butyl peroxy-2-ethylhexanoate *maximum concentration 12%* with 2,2-di-(tert-butyl peroxy)butane *maximum concentration 14%, and with at least 14% phlegmatizer and 60% inert inorganic solid*	5.2	UN 2887	Organic Peroxide	II	1	5	
tert-Butyl peroxy-2-ethyl hexanoate, *technical pure*	5.2	UN 2143	Organic Peroxide	II	1	5	Control temperature 20 deg C. Emergency temperature 25 deg C

Optional Hazardous Materials Table—Continued

(1)	(2)	(3)	(4)	(5)	(6)	(7)		
						Vessel Stowage Requirements		
Notes and Symbols	Hazardous Materials Description and Proper Shipping Names	IMO Class	Identification Number	Label(s) required	Packaging Group	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	tert-Butyl peroxy-2-ethylhexanoate, *with at least 50% phlegmatizer*	5.2	UN 2888	Organic Peroxide	II	1	5	Control temperature 35 deg C. Emergency temperature 40 deg C
	tert-Butyl peroxyisobutyrate, *in a concentration of more than 52% to a maximum concentration of 77% in solution*	5.2	UN 2142	Organic Peroxide	II	1	5	Control temperature 15 deg C. Emergency temperature 20 deg C
	tert-Butyl peroxyisobutyrate, *maximum concentration 52% in solution*	5.2	UN 2562	Organic Peroxide	II	1	5	Emergency temperature 15 deg C. Emergency temperature 20 deg C
	tert-Butyl peroxy isopropyl carbonate, *technical pure*	5.2	UN 2103	Organic Peroxide	II	1	5	
	tert-Butyl peroxyneodecanoate, *maximum concentration 77% in solution*	5.2	UN 2177	Organic Peroxide	II	1	5	Control temperature 0 deg C. Emergency temperature 10 deg C
	tert-Butyl peroxyneodecanoate, *technical pure*	5.2	UN 2594	Organic Peroxide	II	1	5	Control temperature -5 deg C. Emergency temperature 5 deg C
	3-tert-Butylperoxy-3-phenyl phthalide, *technical pure*	5.2	UN 2596	Organic Peroxide	II	1	5	
	tert-Butyl peroxypivalate, *maximum concentration 77% in solution*	5.2	UN 2110	Organic Peroxide	II	1	5	Control temperature 0 deg C. Emergency temperature 10 deg C
	tert-Butyl peroxy-3,5,5-trimethyl hexanoate, *technical pure*	5.2	UN 2104	Organic Peroxide	II	1	5	
	Butylphenols, liquid	6.1	UN 2228	St. Andrews Cross	III	1,2	1,2	
	Butylphenols, solid	6.1	UN 2229	St. Andrews Cross	III	1,2	1,2	
	Butyl phosphoric acid. *See* Butyl acid phosphate							
	Butyl propionate	3.3	UN 1914	Flammable Liquid	II	1,2	1,2	
	Butyl toluenes	6.1	UN 2667	Poison, Flammable Liquid (only if flashpoint below 61 deg C)	III	1,2	1,2	Shade from radiant heat. If flashpoint below 61 deg C segregation same as for flammable liquids
	Butyl trichlorosilane	8	UN 1747	Corrosive, Flammable Liquid	II	1	1	Keep dry. Stow 'separated longitudinally by an intervening complete compartment or hold from' explosives. Segregation same as for flammable liquids
	Butyl vinyl ether, *inhibited*	3.2	UN 2352	Flammable Liquid	II	1,2	1	
	1,4-Butynediol	4.1	UN 2716	Flammable Solid	III	1,2	1	Stow 'separated from' mercury salts, strong acids, alkaline compounds and halides
	Butyraldehyde	3.2	UN 1129	Flammable Liquid	II	1,2	1	
	Butyraldoxime	3.3	UN 2840	Flammable Liquid	III	1,2	1,2	
	n-Butyric acid	8	UN 2820	Corrosive	III	1,3	1,3	Keep cool. Glass carboys in hampers prohibited under deck
	Butyric anhydride	8	UN 2739	Corrosive	III	1,2	1,2	

Butyronitrile	3.2	UN 2411	Flammable Liquid, Poison	II	1,3	5	Keep cool
Butyryl chloride	3.2	UN 2353	Flammable Liquid, Corrosive	II	1	1	Keep dry. Shade from radiant heat
Cacodylic acid	6.1	UN 1572	Poison	II	1,2	5	Stow 'away from' acids
Cadmium compounds	6.1	UN 2570	Poison	I/II	1,2	1,2	Stow 'away from' living quarters
	6.1	UN 2570	St. Andrews Cross	III	1,2	1,2	Stow 'away from' living quarters
Caesium hydroxide, solid	8	UN 2682	Corrosive	II	1,2	1,2	Keep dry
Caesium hydroxide, solution	8	UN 2681	Corrosive	II	1,2	1,2	
Caesium, *metal*	4.3	UN 1407	Dangerous When Wet	I	1,2	5	
Caesium nitrate	5.1	UN 1451	Oxidizer	III	1,2	1,2	
Caesium, *powdered. See* Pyrophoric metals							
Calcium arsenate	6.1	UN 1573	Poison	II	1,2	1,2	
Calcium arsenate and arsenite, *solid mixtures*	6.1	UN 1574	Poison	II	1,2	1,2	
Calcium bisulphite, *solution. See* Calcium hydrogen sulphite, *solution*							
Calcium carbide	4.3	UN 1402	Dangerous When Wet	II	1,2	1,2	Stow 'away from' copper, its alloys and its salts
Calcium chlorate	5.1	UN 1452	Oxidizer	II	1,2	1,2	Stow 'away from' powdered metals and 'separated from' ammonium compounds
Calcium chlorate, *aqueous* solution	5.1	UN 2429	Oxidizer	II	1,2	1	Stow 'away from' powdered metals and 'separated from' ammonium compounds
Calcium chlorite	5.1	UN 1453	Oxidizer	II	1,2	1,2	Stow 'away from' powdered metals and cyanides, 'separated from' ammonium compounds
Calcium cyanamide, *containing more than 0.1% and not more than 0.5% of calcium carbide*	4.3	UN 1403	Dangerous When Wet	III	1,2	1,2	
Calcium cyanamide, *containing more than 0.5% of calcium carbide*	4.3	UN 1403	Dangerous When Wet	III	1,2	1,2	
Calcium cyanide	6.1	UN 1575	Poison	I	1,2	1,2	
Calcium hydride	4.3	UN 1404	Dangerous When Wet	I	1,2	5	
Calcium hydrosulphite	4.2	UN 1923	Spontaneously Combustible	II	1,2	5	Keep dry
Calcium hypochlorate, hydrated *or* Calcium hypochlorite, hydrated mixtures *with not less than 5.5% but not more than 10% water*	5.1	UN 2880	Oxidizer	II	1,2	1,2	Stow 'away from' sources of heat where temperatures in excess of 55 deg C for a period of 24 hours or more will be encountered
Calcium hypochlorite, dry *or* Calcium hypochlorite mixtures, *with more than 39% available chlorine (8.8% available oxygen)*	5.1	UN 1748	Oxidizer	II	1,2	5	Stow 'separated from' ammonium compounds and 'away from' sources of heat
Calcium hypochlorite mixtures, dry, *with more than 10%, but not more than 39%, available chlorine*	5.1	UN 2208	Oxidizer	III	1,2	1,2	
Calcium manganese silicon	4.3	UN 2844	Dangerous When Wet	III	1,2	1,2	
Calcium, *metal and alloys, non-pyrophoric*	4.3	UN 1401	Dangerous When Wet	II	1,2	5	
Calcium nitrate	5.1	UN 1454	Oxidizer	III	1,2	1,2	
Calcium perchlorate	5.1	UN 1455	Oxidizer	II	1,2	1,2	Stow 'away from' powdered metals
Calcium permanganate	5.1	UN 1456	Oxidizer	II	1,2	1,2	Stow 'separated from' ammonium compounds and hydrogen peroxide
Calcium peroxide	5.1	UN 1457	Oxidizer	II	1,2	1,2	Keep dry
Calcium phosphide	4.3	UN 1360	Dangerous When Wet	I	1,2	5	

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Optional Hazardous Materials Table—Continued

(1) Notes and Symbols	(2) Hazardous Materials Description and Proper Shipping Names	(3) IMO Class	(4) Identification Number	(5) Label(s) required	(6) Packaging Group	(7) Vessel Stowage Requirements (a) Cargo vessel	(7) (b) Passenger vessel	(7) (c) Other requirements
	Calcium, pyrophoric *or* Calcium alloys, pyrophoric	4.2	UN 1855	Spontaneously Combustible	II	1	5	
	Calcium resinate, fused	4.1	UN 1314	Flammable Solid	III	1,2	1,2	
	Calcium resinate, *technical pure*	4.1	UN 1313	Flammable Solid	III	1,2	1,2	
	Calcium silicide	4.3	UN 1405	Dangerous When Wet	II	1,2	1,2	
	Calcium silicon	4.3	UN 1406	Dangerous When Wet	III	1,2	1,2	
	Camphor, *natural or synthetic*	4.1	UN 2717	Flammable Solid	III	1,2	1,2	
	Camphor oil	3.3	UN 1130	Flammable Liquid	III	1,3	1,3	
	Capryloyl peroxide. *See* n-Octanoyl peroxide							
	Caps, blasting. *See* Blasting caps							
	Carbamate pesticides, liquid, flammable, toxic, n.o.s., *flashpoint less than 23 deg C*	3.2	UN 2758	Flammable Liquid and Poison or St. Andrews Cross (according to toxicity)	I/II	1,2	1	
	Carbamate pesticides, liquid, toxic, flammable, n.o.s., *flashpoint between 23 deg C and 61 deg C*	6.1	UN 2991	Poison, Flammable Liquid	I	1	1	Segregation same as for flammable liquids
		6.1	UN 2991	Poison, Flammable Liquid	II	1,2	1	Segregation same as for flammable liquids
		6.1	UN 2991	St. Andrews Cross, Flammable Liquid	III	1,2	1,2	Segregation same as for flammable liquids
	Carbamate pesticides, liquid, toxic, n.o.s.	6.1	UN 2992	Poison	I	1	1	
		6.1	UN 2992	Poison	II	1,2	1	
		6.1	UN 2992	St. Andrews Cross	III	1,2	1,2	
	Carbamate pesticides, solid, toxic, n.o.s.	6.1	UN 2757	Poison	I/II	1,2	1,2	
		6.1	UN 2757	St. Andrews Cross	III	1,2	1,2	
	Carbolic acid. *See* Phenols, Phenol solutions *or* Phenol, molten							
	Carbon, activated	4.2	UN 1362	Spontaneously Combustible	III	1,3	1,3	Keep cool. Stow 'away from' oily matter
	Carbon, *animal or vegetable origin*	4.2	UN 1361	Spontaneously Combustible	III	1,3	1,3	Keep cool. Stow 'away from' oily matter
	Carbon bisulphide. *See* Carbon disulphide							
	Carbon dioxide	2.2	UN 1013	Nonflammable Gas	--	1,2	1,2	
	Carbon dioxide and ethylene oxide mixtures *with more than 6% ethylene oxide*	2.3	UN 1041	Poison Gas, Flammable Gas	--	1,2	1	

	Carbon dioxide and ethylene oxide mixtures *with not more than 6% ethylene oxide*	2.3	UN 1952	Poison Gas	–	1,2	1	
	Carbon dioxide and nitrous oxide, *mixtures*	2.2	UN 1015	Nonflammable Gas	–	1,2	1,2	
	Carbon dioxide and oxygen, *mixtures*	2.2	UN 1014	Nonflammable Gas	–	1,2	1,2	
	Carbon dioxide, refrigerated liquid	2.2	UN 2187	Nonflammable Gas	–	1,2	1	
	Carbon dioxide, solid	9	UN 1845	None	III	1	1	Stow 'away from' living quarters
	Carbon disulphide	3.1	UN 1131	Flammable Liquid, Poison	I	1	5	Prohibited on any ship carrying explosives (except explosives in Division 1.4, Compatibility Group S). Keep cool
	Carbon monoxide	2.1	UN 1016	Flammable Gas, Poison Gas	–	1	5	Stow 'away from' living quarters
	Carbon monoxide and hydrogen mixture	2.3	UN 2600	Poison Gas, Flammable Gas	–	1	5	
	Carbon paper. See Paper, treated with unsaturated oils, incompletely dried							
	Carbon remover, *liquid*	3.2	UN 1132	Flammable Liquid	II	1,2	1	
	Carbon sulphide. *See* Carbon disulphide							
	Carbon tetrabromide	6.1	UN 2516	St. Andrews Cross	III	1,2	1,2	Shade from radiant heat
	Carbon tetrachloride	6.1	UN 1846	Poison	II	1,2	1,2	
	Carbonyl chloride. See Phosgene							
	Carbonyl fluoride	2.3	UN 2417	Poison Gas	–	1	5	Stow 'away from' living quarters
	Carbonyl sulfide	2.3	UN 2204	Poison Gas, Flammable Gas	–	1	5	
	Cartridge cases. See Cases, cartridges							
N	Cartridges, flash	1.1G	UN 0049	Explosive (1.1G)	–	–	–	
N	Cartridges, flash	1.3G	UN 0050	Explosive (1.3G)	–	–	–	
	Cartridges for weapons, blank	1.4 C	UN 0338	Explosive (1.4C)	–	1,3	1,3	
N	Cartridges for weapons, blank	1.2C	UN 0413	Explosive (1.2C)	–	–	–	
N	Cartridges for weapons, blank	1.1C	UN 0326	Explosive (1.1C)	–	–	–	
N	Cartridges for weapons, blank	1.3C	UN 0327	Explosive (1.3C)	–	–	–	
	Cartridges for weapons, blank *or* Cartridges, safety, blank	1.4 S	UN 0014	None. Package to be marked '1.4 S'	–	1,3	1,3	
	Cartridges for weapons, *other than blank*	1.4 S	UN 0012	None. Package to be marked '1.4 S'	–	1,3	1,3	
N	Cartridges for weapons, *with bursting charge*	1.1E	UN 0006	Explosive (1.1E)	–	–	–	
N	Cartridges for weapons, *with bursting charge*	1.2E	UN 0321	Explosive (1.2E)	–	–	–	
N	Cartridges for weapons, *with bursting charge*	1.1F	UN 0005	Explosive (1.1F)	–	–	–	
N	Cartridges for weapons, *with bursting charge*	1.2F	UN 0007	Explosive (1.2F)	–	–	–	
	Cartridges for weapons, *with bursting charge*	1.4E	UN 0412	Explosive (1.4E)	–	1,3	1,3	
N	Cartridges for weapons, *with bursting charge*	1.4F	UN 0348	Explosive (1.4F)	–	–	–	
	Cartridges for weapons, with inert projectile	1.4 C	UN 0339	Explosive (1.4C)	–	1,3	1,3	
N	Cartridges for weapons, with inert projectile	1.2C	UN 0328	Explosive (1.2C)	–	–	–	
N	Cartridges for weapons, with inert projectile	1.3C	UN 0417	Explosive (1.3C)	–	–	–	
	Cartridges, oil well	1.4 C	UN 0278	Explosive (1.4C)	–	1,3	1,3	
N	Cartridges, oil well	1.3C	UN 0277	Explosive (1.3C)	–	–	–	

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Optional Hazardous Materials Table—Continued

(1)	(2)	(3)	(4)	(5)	(6)	(7)		
						Vessel Stowage Requirements		
Notes and Symbols	Hazardous Materials Description and Proper Shipping Names	IMO Class	Identification Number	Label(s) required	Packaging Group	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Cartridges, power device	1.4 C	UN 0276	Explosive (1.4C)	–	1,3	1,3	
	Cartridges, power device	1.4 S	UN 0323	None. Package to be marked '1.4 S'	–	1,3	1,3	
N	Cartridges, power device	1.2C	UN 0381	Explosive (1.2C)	–	–	–	
N	Cartridges, power device	1.3C	UN 0275	Explosive (1.3C)	–	–	–	
	Cartridges, safety. *See* Cartridges for weapons, *other than blank (UN 0012) or* Cartridges for weapons, blank *(UN 0014)*							
	Cartridges, signal	1.4 G	UN 0312	Explosive (1.4G)	–	1,3	1,3	
N	Cartridges, signal	1.3G	UN 0054	Explosive (1.3G)	–	–	–	
	Cartridges, signal	1.4S	UN 0405	None. Package to be marked '1.4S'	–	1.3	1,3	
	Cases, cartridge, empty, with primer	1.4C	UN 0379	Explosive (1.4C)	–	1,3	1,3	
	Cases, cartridges, empty, with primer	1.4 S	UN 0055	None. Package to be marked '1.4 S'	–	1,3	1,3	
	Casinghead gasoline	3.1	UN 1257	Flammable Liquid	II	1,3	5	Keep cool
	Castor beans, Castor meal, Castor pomace *or* Castor flake	9	UN 2969	None	II	1,2	5	Stow 'away from' living quarters, foodstuffs, and oxidizing substances
	Caustic alkali liquids, n.o.s.	8	UN 1719	Corrosive	II	1,2	1,2	
	Caustic potash. *See* Potassium hydroxide, *solution*							
	Caustic potash, solid. *See* Potassium hydroxide, *solid*							
	Celluloid, *in blocks, rods, rolls, sheets, tubes, etc. (scrap excluded)*	4.1	UN 2000	Flammable Solid	III	1,2	1,2	
	Celluloid, scrap	4.2	UN 2002	Spontaneously Combustible	III	1	5	
	Cement, *liquid. See Adhesives, containing a flammable liquid*							
	Cerium, crude, *powder*	4.1	UN 1333	Flammable Solid	II	1,2	5	Stow 'separated from' flammable substances and oxidizers
	Cerium, crude, *slabs or ingots*	4.1	UN 1333	Flammable Solid	III	1,2	1,2	Stow 'separated from' flammable substances and oxidizers
	Charcoal, activated. *See* Carbon, activated							
	Charcoal, non-activated, of animal or vegetable origin. See Carbon, *of animal or vegetable origin*							
N	Charges, demolition	1.1D	UN 0048	Explosive (1.1D)	–	–	–	
N	Charges, depth	1.1D	UN 0056	Explosive (1.1D)	–	–	–	
N	Charges, propelling, for cannon	1.1C	UN 0279	Explosive (1.1C)	–	–	–	

N	Charges, propelling, for cannon	1.2C	UN 0414	Explosive (1.2C)	–	–	–	
N	Charges, propelling, for cannon	1.3C	UN 0242	Explosive (1.3C)	–	–	–	
N	Charges, propelling, for rocket motors	1.1C	UN 0271	Explosive (1.1C)	–	–	–	
N	Charges, propelling, for rocket motors	1.2C	UN 0415	Explosive (1.2C)	–	–	–	
N	Charges, propelling, for rocket motors	1.3C	UN 0272	Explosive (1.3C)	–	–	–	
N	Charges, propelling, for rocket motors, *composite mixture*	1.1C	UN 0273	Explosive (1.1C)	–	–	–	
N	Charges, propelling, for rocket motors, *composite mixture*	1.2C	UN 0416	Explosive (1.2C)	–	–	–	
N	Charges, propelling, for rocket motors, *composite mixture*	1.3C	UN 0274	Explosive (1.3C)	–	–	–	
N	Charges, shaped, commercial, *without detonator*	1.1D	UN 0059	Explosive (1.1D)	–	–	–	
	Charges, shaped, flexible, linear, *metal clad*	1.4 D	UN 0237	Explosive (1.4D)	–	1,3	1,3	
N	Charges, shaped, flexible, linear, *metal clad*	1.1D	UN 0288	Explosive (1.1D)	–	–	–	
N	Charges, supplementary, explosive	1.1D	UN 0060	Explosive (1.1D)	–	–	–	
	Chloral, *anhydrous, inhibited*	6.1	UN 2075	Poison	II	1	5	
	Chlorate and borate, mixtures	5.1	UN 1458	Oxidizer	II	1,2	1,2	Stow 'away from' powdered metals and 'separated from' ammonium compounds
	Chlorate and magnesium chloride, mixture	5.1	UN 1459	Oxidizer	II	1,2	1,2	Stow 'away from' powdered metals and 'separated from' ammonium compounds
	Chlorates, inorganic, n.o.s.	5.1	UN 1461	Oxidizer	II	1,2	1,2	Stow 'away from' powdered metals and 'separated from' ammonium compounds
	Chloric acid solution *with not more than 10% acid*	5.1	UN 2626	Oxidizer	II	1	5	Stow 'separated from' ammonium compounds and 'away from' finely powdered metals
	Chlorine	2.3	UN 1017	Poison Gas	–	1	5	Stow 'separated from' acetylene, ammonia, diborane and hydrogen
	Chlorine pentafluoride	2.3	UN 2548	Poison Gas, Oxidizer, Corrosive	–	1	5	Stow 'away from' combustible materials
	Chlorine trifluoride	2.3	UN 1749	Poison Gas, Oxidizer, Corrosive	–	1,2	5	Stow 'away from' food stuffs and living quarters
	Chlorites, inorganic, n.o.s.	5.1	UN 1462	Oxidizer	II	1,2	1,2	Stow 'away from' powdered metals and cyanides, 'separated from' ammonium compounds
	Chloroacetaldehyde	6.1	UN 2232	Poison	II	1	5	
	Chloroacetic acid, *liquid*	8	UN 1750	Corrosive	II	1,2	1,2	Glass carboys in hampers not permitted under deck
	Chloroacetic acid, solid	8	UN 1751	Corrosive	II	1,2	1,2	Keep dry
	Chloroacetone, *stabilized*	6.1	UN 1695	Poison	II	1	5	Stow 'away from' living quarters
	Chloroacetonitrile	6.1	UN 2668	Poison, Flammable Liquid	II	1,3	1,3	Keep cool. Shade from radiant heat. Stow 'away from' acids. Segregation same as for flammable liquids
	Chloroacetophenone	6.1	UN 1697	Poison	II	1	5	Keep cool. Stow 'away from' living quarters
	Chloroacetyl chloride	8	UN 1752	Corrosive	II	1	5	Keep dry
	Chloroanilines, *liquid*	6.1	UN 2019	Poison	II	1,2	1,2	
	Chloroanilines, *solid*	6.1	UN 2018	Poison	II	1,2	1,2	
	p-Chloro-o-anisidine	6.1	UN 2233	St. Andrews Cross	III	1,2	1,2	
	Chlorobenzene	3.3	UN 1134	Flammable Liquid	II	1,3	1,3	
	Chlorobenzotrifluorides	3.3	UN 2234	Flammable Liquid	III	1,2	1,2	
	p-Chlorobenzoyl peroxide. *See* Di-(4-chlorobenzoyl) peroxide				–	–	–	

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Optional Hazardous Materials Table—Continued

(1) Notes and Symbols	(2) Hazardous Materials Description and Proper Shipping Names	(3) IMO Class	(4) Identification Number	(5) Label(s) required	(6) Packaging Group	(7) Vessel Stowage Requirements (a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	p-Chlorobenzyl chloride	6.1	UN 2235	St. Andrews Cross	III	1,2	1,2	
	1-Chloro-3-bromopropane	6.1	UN 2688	St. Andrews Cross	III	1,2	1,2	
	Chlorobutanes	3.2	UN 1127	Flammable Liquid	II	1,2	1	
	Chlorocresols	6.1	UN 2669	Poison	II	1,3	1,3	Keep cool. Stow 'away from' living quarters
	Chlorodifluorobromomethane	2.2	UN 1974	Nonflammable Gas	--	1,2	1,2	
	Chlorodifluoroethanes	2.1	UN 2517	Flammable Gas	--	1,2	1	Stow 'away from' living quarters
	Chlorodifluoromethane	2.2	UN 1018	Nonflammable Gas	--	1,2	1,2	
	Chlorodifluoromethane and chloropentafluoroethane, *mixture with a fixed boiling point containing about 49% of chlorodifluoromethane*	2.2	UN 1973	Nonflammable Gas	--	1,2	1,2	
	Chlorodinitrobenzene	6.1	UN 1577	Poison	II	1,2	1,2	
	Chloroform	6.1	UN 1888	Poison	II	1,2	1,2	
	Chloroformates, n.o.s., *with a flashpoint not less than 23 deg C*	6.1	UN 2742	Poison, Corrosive, Flammable Liquid (only if flashpoint below 61 deg C)	II	1,3	1,3	Keep cool and dry. Shade from radiant heat. Stow 'away from' living quarters. If flashpoint below 61, segregation same as for flammable liquids
	Chloromethylchloroformate	6.1	UN 2745	Poison, Corrosive	II	1,3	1,3	Keep cool and dry. Shade from radiant heat. Stow 'away from' living quarters
	Chloromethyl ethyl ether	3.2	UN 2354	Flammable Liquid, Poison	II	1,3	5	Keep cool
	3-Chloro-4-methylphenyl isocyanate	6.1	UN 2236	Poison	II	1,2	1,2	Shade from radiant heat
	Chloronitroanilines	6.1	UN 2237	St. Andrews Cross	III	1,2	1,2	
	Chloronitrobenzenes *(o-, m-, p-)*	6.1	UN 1578	Poison	II	1,2	1,2	
	Chloro-o-nitrotoluene	6.1	UN 2433	St. Andrews Cross	III	1,2	1,2	
	Chloropentafluoroethane	2.2	UN 1020	Nonflammable Gas	--	1,2	1,2	
	3-Chloroperoxybenzoic acid, *maximum concentration 86%*	5.2	UN 2755	Organic Peroxide	II	1	5	
	Chlorophenates, liquid	8	UN 2904	Corrosive	III	1,2	1,2	
	Chlorophenates, solid	8	UN 2905	Corrosive	III	1,2	1,2	
	Chlorophenols, liquid	6.1	UN 2021	St. Andrews Cross	III	1,2	1,2	
	Chlorophenols, solid	6.1	UN 2020	St. Andrews Cross	III	1,2	1,2	
	Chlorophenyl trichlorosilane	8	UN 1753	Corrosive	II	1	1	Keep dry
	Chloropicrin	6.1	UN 1580	Poison	I	1	5	Stow 'away from' living quarters
	Chloropicrin and methyl bromide, *mixtures*	2.3	UN 1581	Poison Gas	--	1	5	Shade from radiant heat. Stow 'away from' living quarters

Chloropicrin and methyl chloride, *mixtures*	2.3	UN 1582	Poison Gas	--	1	5	Shade from radiant heat. Stow 'away from' living quarters
Chloropicrin mixtures, n.o.s.	6.1	UN 1583	Poison	I/II	1	1	Stow 'away from' living quarters
	6.1	UN 1583	St. Andrews Cross	III	1	1	
Chloroplatinic acid, solid	8	UN 2507	Corrosive	III	1,2	1,2	
Chloroprene, inhibited	3.2	UN 1991	Flammable Liquid, Poison	I	1,2	1	
2-Chloropropane	3.1	UN 2356	Flammable Liquid	I	1,3	5	Keep cool
3-Chloropropanol-1	6.1	UN 2849	St. Andrews Cross	III	1,2	1,2	
2-Chloropropene	3.1	UN 2456	Flammable Liquid	I	1,3	5	Keep cool
Chloropropionic acid	8	UN 2511	Corrosive	III	1,2	1,2	Glass carboys prohibited on passenger vessels
2-Chloropyridine	6.1	UN 2822	Poison	II	1,2	1,2	Stow 'away from' living quarters
Chlorosulphonic acid, *with or without sulphur trioxide*	8	UN 1754	Corrosive	I	1	1	Glass carboys prohibited on passenger vessels
Chlorotetrafluoroethane	2.2	UN 1021	Nonflammable Gas	--	1,2	1,2	
Chlorotoluenes *(o-, m-, p-)*	3.3	UN 2238	Flammable Liquid	III	1,2	1,2	
4-Chloro-o-toluidine hydrochloride	6.1	UN 1579	St. Andrews Cross	III	1,2	1,2	
Chlorotoluidines	6.1	UN 2239	St. Andrews Cross	III	1,2	1,2	
Chlorotrifluoroethane	2.2	UN 1983	Nonflammable Gas	--	1,2	1,2	
Chlorotrifluoroethylene. See Trifluorochloroethylene							
Chlorotrifluoromethane	2.2	UN 1022	Nonflammable Gas	--	1,2	1,2	
Chlorotrifluoromethane and trifluormethane azeotropic mixture *with approximately 60% chlorotrifluoromethane*	2.2	UN 2599	Nonflammable Gas	--	1,2	1,2	
Chromic acid, solid. *See* Chromium trioxide, anhydrous							
Chromic acid, *solution*	8	UN 1755	Corrosive	II	1	1	
Chromic anhydride. *See* Chromium trioxide, anhydrous							
Chromic fluoride, solid	8	UN 1756	Corrosive	II	1,2	1,2	
Chromic fluoride, solution	8	UN 1757	Corrosive	II	1,2	1,2	
Chromium nitrate	5.1	UN 2720	Oxidizer	III	1,2	1,2	
Chromium oxychloride	8	UN 1758	Corrosive	I	1	1	Keep dry. Glass carboys prohibited on passenger vessels
Chromium trioxide, anhydrous	5.1	UN 1463	Oxidizer, Corrosive	II	1,2	1,2	Stow 'separated from' flammable substances and 'away from' foodstuffs
Chromosulphuric acid	8	UN 2240	Corrosive	I	1,2	1	Carboys not permitted on passenger vessels and permitted only on deck on cargo vessels
Chrysotile. See Asbestos, white							
Cigarettes, *self-lighting*	4.1	UN 1867	Flammable Solid	III	1,2	1,2	Keep dry
Cleaning compound. *See* Flammable liquid preparations, n.o.s.							
Coal gas	2.3	UN 1023	Poison Gas, Flammable Gas	--	1	5	
Coal tar distillate	3.2	UN 1136	Flammable Liquid	II	1,2	1	
	3.3	UN 1136	Flammable Liquid	III	1,2	1,2	
Coal tar naphtha	3.2	UN 2553	Flammable Liquid	II	1,2	1	
Coal tar oil. *See* Coal tar distillate							

Optional Hazardous Materials Table—Continued

(1) Notes and Symbols	(2) Hazardous Materials Description and Proper Shipping Names	(3) IMO Class	(4) Identification Number	(5) Label(s) required	(6) Packaging Group	(7) Vessel Stowage Requirements (a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Coating solution	3.2	UN 1139	Flammable Liquid	II	1,2	1	
		3.3	UN 1139	Flammable Liquid	II	1,2	1,2	
	Cobalt naphthenates, *powder*	4.1	UN 2001	Flammable Solid	III	1,2	1,2	
	Cobalt resinate, *precipitated*	4.1	UN 1318	Flammable Solid	III	1,2	1,2	
	Cocculus, *solid*	6.1	UN 1584	Poison	II	1,2	1,2	
	Cologne spirits. *See* Ethanol							
	Columbian spirits. *See* Methanol							
	Components, explosive train, n.o.s.	1.4B	UN 0383	Explosive (1.4B)	--	1,3	1,3	
	Components, explosive train, n.o.s.	1.4S	UN 0384	None. Package to be marked '1.4S'	--	1,3	1,3	
N	Components, explosive train, n.o.s.	1.2B	UN 0382	Explosive (1.2B)	--	--	--	
	Compressed *or* liquefied gases, flammable, *non-toxic*, n.o.s.	2.1	UN 1954	Flammable Gas	--	1	5	Stow 'away from' living quarters
	Compressed *or* liquefied gases, flammable, toxic, n.o.s.	2.1	UN 1953	Flammable Gas, Poison Gas	--	1	5	Stow 'away from' living quarters
	Compressed *or* liquefied gases, *non-flammable, non-toxic*, n.o.s.	2.2	UN 1956	Nonflammable Gas	--	1,2	1,2	
	Compressed *or* liquefied gases, *non-flammable*, toxic, n.o.s.	2.3	UN 1955	Poison Gas	--	1	5	Stow 'away from' living quarters
N	Contrivances, water-activated, *with burster, expelling charge or propelling charge*	1.2L	UN 0248	Explosive (1.2L), Dangerous When Wet	--	--	--	
N	Contrivances, water-activated, *with burster, expelling charge or propelling charge*	1.3L	UN 0249	Explosive (1.3L), Dangerous When Wet	--	--	--	
	Copper acetoarsenite	6.1	UN 1585	Poison	II	1,2	1,2	
	Copper arsenite	6.1	UN 1586	Poison	II	1,2	1,2	
	Copper based pesticides, liquid, flammable, toxic, n.o.s. *flashpoint less than 23 deg C*	3.2	UN 2776	Flammable Liquid and Poison or St. Andrews Cross (according to toxicity)	I/II	1,2	1	
	Copper based pesticides, liquid, toxic, flammable, n.o.s., *flashpoint between 23 deg C and 61 deg C*	6.1	UN 3009	Poison, Flammable Liquid	I	1	1	Segregation same as for flammable liquids
		6.1	UN 3009	Poison, Flammable Liquid	II	1,2	1	Segregatimn same as for flammable liquids
		6.1	UN 3009	St. Andrews Cross, Flammable Liquid	III	1,2	1,2	Segregation same as for flammable liquids

	Copper based pesticides, liquid, toxic, n.o.s.	6.1	UN 3010	Poison	I	1	1	
		6.1	UN 3010	Poison	II	1,2	1	
		6.1	UN 3010	St. Andrews Cross	III	1,2	1,2	
	Copper based pesticides, solid, toxic, n.o.s.	6.1	UN 2775	Poison	I/II	1,2	1,2	
		6.1	UN 2775	St. Andrews Cross	III	1,2	1,2	
	Copper chlorate	5.1	UN 2721	Oxidizer	II	1,2	1,2	Stow 'separated from' ammonium compounds and 'away from' finely powdered metals
	Copper cyanide	6.1	UN 1587	Poison	II	1,2	1,2	Stow 'away from' acids
	Copra	4.2	UN 1363	None. Package to be marked 'Class 4.2'	III	1,2	1,2	Keep dry. Protect from sparks and open flame
	Cord, detonating, *flexible*	1.4 D	UN 0289	Explosive (1.4D)	–	1,3	1,3	
N	Cord, detonating, *flexible*	1.1D	UN 0065	Explosive (1.1D)	–	–	–	
N	Cord, detonating, *metal clad*	1.1D	UN 0290	Explosive (1.1D)	–	–	–	
N	Cord, detonating, *metal clad*	1.2D	UN 0102	Explosive (1.2D)	–	–	–	
	Cord, detonating, mild effect, *metal clad*	1.4 D	UN 0104	Explosive (1.4D)	–	1,3	1,3	
	Cord, igniter	1.4 G	UN 0066	Explosive (1.4G)	–	1,3	1,3	
	Corrosive liquids, flammable, n.o.s.	8	UN 2920	Corrosive, Flammable Liquid	I/II	1	1	Segregation same as for flammable liquids. Keep cool. Shade from radiant heat
	Corrosive liquids, n.o.s.	8	UN 1760	Corrosive	I/II	1,2	1	
		8	UN 1760	Corrosive	III	1,2	1,2	
	Corrosive liquids, poisonous, n.o.s.	8	UN 2922	Corrosive, Poison	I/II	1,2	1	Stow 'away from' living quarters
	Corrosive solids, flammable, n.o.s.	8	UN 2921	Corrosive, Flammable Solid	I/II	1,3	1	Keep cool. Shade from radiant heat
	Corrosive solids, n.o.s.	8	UN 1759	Corrosive	I	1,2	1	Keep dry
		8	UN 1759	Corrosive	II/III	1,2	1,2	Keep dry
	Corrosive solids, poisonous, n.o.s.	8	UN 2923	Corrosive, Poison	I/II	1,2	1	Keep dry. Stow 'away from' living quarters
	Cosmetics. *See* Perfumery products							
	Cotton, dry. *See* Fibres, *vegetable, dry*							
	Cotton waste, oily *impregnated with less than 5% of animal or vegetable oil*	4.2	UN 1364	Spontaneously Combustible	III	1,2	1,2	Stow 'separated from' explosives
	Cotton waste, oily *impregnated with 5%, or more, of animal or vegetable oil*	4.2	UN 1364	Spontaneously Combustible	III	1,2	1,2	Keep dry. Stow 'separated from' explosives, animal oils or vegetable oils
	Cotton, *wet or contaminated*	4.2	UN 1365	Spontaneously Combustible	III	1,2	1,2	Keep dry
	Cresols *(o-, m-, p-)*	6.1	UN 2076	Poison	II	1,2	1,2	
	Cresylic acid	6.1	UN 2022	Poison	II	1,2	1,2	
	Crocidolite. *See* Asbestos, blue							
	Crotonaldehyde, inhibited	3.2	UN 1143	Flammable Liquid	II	1,2	1	
	Crotonic acid	8	UN 2823	Corrosive	III	1,3	1,3	Keep cool
	Crotonylene	3.1	UN 1144	Flammable Liquid	I	1,3	5	Keep cool
	Cumene hydroperoxide. *See* Cumyl hydroperoxide				–	–	–	
	Cumyl hydroperoxide, *technical pure*	5.2	UN 2116	Organic Peroxide	I	1	5	
	Cumyl peroxyneodecanoate, *maximum concentration 77% in solution*	5.2	UN 2963	Organic Peroxide	II	1	5	Control temperature −10 deg C. Emergency temperature 0 deg C

Optional Hazardous Materials Table—Continued

(1)	(2)	(3)	(4)	(5)	(6)	(7) Vessel Stowage Requirements		
Notes and Symbols	Hazardous Materials Description and Proper Shipping Names	IMO Class	Identification Number	Label(s) required	Packaging Group	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Cumyl peroxypivalate, *maximum concentration 77% in solution*	5.2	UN 2964	Organic Peroxide	II	1	5	Control temperature −5 deg C. Emergency temperature 5 deg C
	Cupric cyanide. *See* Copper cyanide							
	Cupriethylenediamine, solution	8	UN 1761	Corrosive, Poison	II	1,2	1,2	
	Cut-backs, *asphalt or bitumen*	3.2 3.3	UN 1999 UN 1999	Flammable Liquid Flammable Liquid	II II	1,2 1,2	1 1,2	
	Cutters, cable, explosive	1.4 S	UN 0070	None. Package to be marked '1.4 S'	--	1,3	1,3	
	Cyanide mixtures. *See* Cyanides, *(inorganic)*, n.o.s.							
	Cyanides, inorganic, n.o.s.	6.1	UN 1588	Poison	I/II	1,2	1,2	Stow 'away from' acids.
		6.1	UN 1588	St. Andrews Cross	III	1,2	1.2	Stow 'away from' acids
	Cyanide, solutions	6.1	UN 1935	Poison	I	1,2	1,2	Stow 'away from' living quarters and acids
	Cyanogen	2.3	UN 1026	Poison Gas, Flammable Gas	--	1	5	Stow 'away from' foodstuffs and living quarters
	Cyanogen bromide	6.1	UN 1889	Poison, Corrosive	I	1	5	Shade from radiant heat. Segregation same as for corrosives
	Cyanogen chloride, *inhibited*	2.3	UN 1589	Poison Gas	--	1	5	
	Cyanuric chloride	8	UN 2670	Corrosive	III	1,3	1,3	Keep dry and cool
	Cyclobutane	2.1	UN 2601	Flammable Gas	--	1,2	1	
	Cyclobutylchloroformate	6.1	UN 2744	Poison, Corrosive, Flammable Liquid	II	1,3	1,3	Keep cool and dry. Shade from radiant heat. Stow 'away from' living quarters. Segregation same as for flammable liquids
	1,5,9-Cyclododecatriene	8	UN 2518	Corrosive	II	1,2	5	Stow 'away from' living quarters
	Cycloheptane	3.2	UN 2241	Flammable Liquid	II	1,2	1	
	Cycloheptatriene	3.2	UN 2603	Flammable Liquid, Poison	II	1,3	5	Keep cool
	Cycloheptene	3.2	UN 2242	Flammable Liquid	II	1,2	1	
	Cyclohexane	3.1	UN 1145	Flammable Liquid	II	1,3	5	Keep cool
	Cyclohexanone	3.3	UN 1915	Flammable Liquid	III	1,2	1,2	
	Cyclohexanone peroxides, *in a concentration of more than 90% with less than 10% water*	5.2	UN 2117	Organic Peroxide	I	1	5	
	Cyclohexanone peroxides, *maximum concentration 90%, with at least 10% water*	5.2	UN 2119	Organic Peroxide	I	1	5	

	Cyclohexanone peroxides, *maximum concentration 72% and containing not more than 9% available oxygen, in solution*	5.2	UN 2118	Organic Peroxide	I	1	5	
	Cyclohexanone peroxides, *maximum concentration 72% and containing not more than 9% available oxygen, as a paste*	5.2	UN 2896	Organic Peroxide	II	1	5	
	Cyclohexene	3.1	UN 2256	Flammable Liquid	II	1,3	5	Keep cool
	Cyclohexene	3.2	UN 2256	Flammable Liquid	II	1,2	1	
	Cyclohexenyl trichlorosilane	8	UN 1762	Corrosive	II	1	1	Keep dry
	Cyclohexyl acetate	3.3	UN 2243	Flammable Liquid	III	1,2	1,2	
	Cyclohexylamine	3.2	UN 2357	Flammable Liquid, Corrosive	II	1,2	1	
		3.3	UN 2357	Flammable Liquid, Corrosive	II	1,2	1,2	
	Cyclohexyl isocyanate	6.1	UN 2488	Poison, Flammable Liquid	II	1	5	Shade from radiant heat. Stow 'away from' living quarters. Segregation same as for flammable liquids
	Cyclohexyl trichlorosilane	8	UN 1763	Corrosive	II	1	1	Keep dry
	Cyclooctadienes	3.3	UN 2520	Flammable Liquid	II	1,2	1,2	
	Cyclooctatetraene	3.2	UN 2358	Flammable Liquid	II	1,2	1	
	Cyclopentane	3.1	UN 1146	Flammable Liquid	II	1,3	5	Keep cool
	Cyclopentanol	3.3	UN 2244	Flammable Liquid	III	1,2	1,2	
	Cyclopentanone	3.3	UN 2245	Flammable Liquid	II	1,2	1,2	
	Cyclopentene	3.1	UN 2246	Flammable Liquid	II	1,3	5	Keep cool
	Cyclopropane, liquefied	2.1	UN 1027	Flammable Gas	–	1,2	1	
N	Cyclotetramethylenetetranitramine, wetted *with not less than 25% water, by weight, or* desensitized *with not less than 10% phlegmatizer, by weight*	1.1D	UN 0226	Explosive (1.1D)	–	–	–	
N	Cyclotrimethylenetrinitramine and cyclotetramethylenetetranitramine, mixtures, wetted *with not less than 25% water, by weight, or* desensitized *with not less than 10% phlegmatizer, by weight*	1.1D	UN 0391	Explosive (1.1D)	–	–	–	
N	Cyclotrimethylenetrinitramine, wetted *with not less than 25% water, by weight, or* desensitized *with not less than 10% phlegmatizer, by weight*	1.1D	UN 0072	Explosive (1.1D), Corrosive	–	–	–	
	Cymenes	3.3	UN 2046	Flammable Liquid	II	1,2	1,2	
	Decaborane	4.1	UN 1868	Flammable Solid, Poison	II	1,2	1,2	
	Decahydronaphthalene	3.3	UN 1147	Flammable Liquid	II	1,2	1,2	
	Decalin. See Decahydronaphthalene							
	n-Decane	3.3	UN 2247	Flammable Liquid	III	1,2	1,2	
N	Deflagrating metal salts of aromatic nitro-derivatives, n.o.s.	1.3C	UN 0132	Explosive (1.3C)	–	–	–	
	Detonator assemblies, non-electric, *for blasting*	1.4B	UN 0361	Explosive (1.4B)	–	1,3	1,3	
N	Detonator assemblies, non-electric, *for blasting*	1.1B	UN 0360	Explosive (1.1B)	–	–	–	
	Detonators, electric, *for blasting*	1.4 B	UN 0255	Explosive (1.4B)	–	1,2	5	
N	Detonators, electric, *for blasting*	1.1B	UN 0030	Explosive (1.1B)	–	–	–	
	Detonators for ammunition	1.4B	UN 0365	Explosive (1.4B)	–	1,3	1,3	
	Detonators for ammunition	1.4S	UN 0366	None. Package to be marked '1.4S'	–	1,3	1,3	

Optional Hazardous Materials Table—Continued

(1)	(2)	(3)	(4)	(5)	(6)	(7) Vessel Stowage Requirements		
Notes and Symbols	Hazardous Materials Description and Proper Shipping Names	IMO Class	Identification Number	Label(s) required	Packaging Group	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
N	Detonators for ammunition	1.1B	UN 0073	Explosive (1.1B)	--	--	--	
N	Detonators for ammunition	1.2B	UN 0364	Explosive (1.2B)	--	--	--	
	Detonators, non-electric, *for blasting*	1.4 B	UN 0267	Explosive (1.4B)	--	1,2	5	
N	Detonators, non-electric, *for blasting*	1.1B	UN 0029	Explosive (1.1B)	--	--	--	
	Deuterium	2.1	UN 1957	Flammable Gas	--	1,2	5	
	Diacetone alcohol	3.2	UN 1148	Flammable Liquid	II	1,2	1	
		3.3	UN 1148	Flammable Liquid	II	1,2	1,2	
	Diacetone alcohol peroxides, *maximum 57% in solution with maximum 9% hydrogen peroxide, minimum 26% diacetone alcohol and minimum 9% water: total active oxygen content maximum 10%*	5.2	UN 2163	Organic Peroxide	I	1	5	Control temperature 30 deg C. Emergency temperature 35 deg C
	Diallylamine	3.2	UN 2359	Flammable Liquid	II	1,2	1	
	Diallylether	3.2	UN 2360	Flammable Liquid, Poison	II	1,3	5	Keep cool
	4,4'-Diaminodiphenyl methane	6.1	UN 2651	St. Andrews Cross	III	1,2	1,2	
	Di-n-amylamine	6.1	UN 2841	St. Andrews Cross, Flammable Liquid	III	1,3	1,3	Keep cool. Shade from radiant heat. Segregation same as for flammable liquids
N	Diazodinitrophenol, *containing, by weight, at least 40% water or mixture of alcohol and water*	1.1A	UN 0074	Explosive (1.1A)	--	--	--	
	Dibenzyldichlorosilane	8	UN 2434	Corrosive	II	1	1	Keep dry
	Dibenzyl peroxydicarbonate, *maximum concentration 87% with water*	5.2	UN 2149	Organic Peroxide	I	1	5	Control temperature 25 deg C. Emergency temperature 30 deg C
	Diborane	2.1	UN 1911	Flammable Gas, Poison Gas	--	1	5	Stow 'separated from' chlorine and oxidizers
	Dibromobenzene	3.3	UN 2711	Flammable Liquid	III	1,2	1,2	
	1,2-Dibromobutan-3-one	6.1	UN 2648	Poison	II	1,2	1	
	1,2-Dibromo-3-chloropropane	6.1	UN 2872	St. Andrews Cross	III	1,2	1,2	
	Dibromodifluoromethane	9	UN 1941	None	III	1,2	1,2	Shade from radiant heat. Stow 'away from' foodstuffs
	Dibromomethane	6.1	UN 2664	St. Andrews Cross	III	1,2	1,2	
	Di-(n-butyl)amine	8	UN 2248	Corrosive, Flammable Liquid	II	1,2	1,2	Segregation same as for flammable liquids
	N,N-Di-n-butylaminoethanol	6.1	UN 2873	St. Andrews Cross	III	1,2	1,2	
	Di-(4-tert-butylcyclohexyl) peroxydicarbonate, *maximum concentration 42%, stable dispersion in water*	5.2	UN 2894	Organic Peroxide	II	1	5	Control temperature 25 deg C. Emergency temperature 30 deg C

Di-(4-tert-butylcyclohexyl) peroxydicarbonate, *technical pure*	5.2	UN 2154	Organic Peroxide	II	1	5	Control temperature 30 deg C. Emergency temperature 35 deg C
Dibutyl ethers	3.3	UN 1149	Flammable Liquid	III	1,2	1,2	
Di-tert-butyl peroxide, *technical pure*	5.2	UN 2102	Organic Peroxide, Flammable Liquid	II	1	5	
2,2-Di-(tert-butylperoxy) butane, *maximum concentration 55% in solution*	5.2	UN 2111	Organic Peroxide	II	1	5	
1,1-Di-(tert-butylperoxy) cyclohexane, *maximum concentration 77% in solution*	5.2	UN 2180	Organic Peroxide	II	1	5	
1,1-Di-(tert-butylperoxy) cyclohexane, *technical pure*	5.2	UN 2179	Organic Peroxide	II	1	5	
1,1-Di-(tert-butylperoxy) cyclohexane *with at least 13% phlegmatizer and 47% inert inorganic solid*	5.2	UN 2885	Organic Peroxide	II	1	5	
1,1-Di-(tert-butylperoxy) cyclohexane *with at least 50% phlegmatizer*	5.2	UN 2897	Organic Peroxide	II	1	5	
Di-sec-butyl peroxydicarbonate, *maximum concentration 52% in solution*	5.2	UN 2151	Organic Peroxide	II	1	5	Control temperature −15 deg C. Emergency temperature −5 deg C
Di-sec-butyl peroxydicarbonate, *technical pure*	5.2	UN 2150	Organic Peroxide	I	1	5	Control temperature −20 deg C. Emergency temperature −10 deg C
1,4-Di-(2-tert-butylperoxy isopropyl) benzene, *or* ,1,3-di-(2-tert-butylperoxy isopropyl) benzene, *or* mixtures *thereof, technical pure or in a concentration of more than 40% with inert solid*	5.2	UN 2112	Organic Peroxide	II	1	5	
Di-(tert-butylperoxy)phthalate, *maximum concentration 55% as a paste*	5.2	UN 2108	Organic Peroxide	II	1	5	
Di-(tert-butylperoxy)phthalate, *maximum concentration 55% in solution*	5.2	UN 2107	Organic Peroxide	II	1	5	
Di-(tert-butylperoxy)phthalate, *technical pure*	5.2	UN 2106	Organic Peroxide	II	1	5	
2,2-Di-(tert-butylperoxy) propane, *with at least 50% phlegmatizer*	5.2	UN 2883	Organic Peroxide	II	1	5	
2,2-Di-(tert-butylperoxy) propane, *with at least 13% phlegmatizer and 47% inert inorganic solid*	5.2	UN 2884	Organic Peroxide	II	1	5	
1,1-Di-(tert-butylperoxy)-3,3,5-trimethyl cyclohexane, *technical pure*	5.2	UN 2145	Organic Peroxide	II	1	5	
1,1-Di-(tert-butylperoxy)-3,3,5-trimethyl cyclohexane, *maximum concentration 57% in solvent*	5.2	UN 2146	Organic Peroxide	II	1	5	
1,1-Di-(tert-butylperoxy)-3,3,5-trimethyl cyclohexane, *maximum concentration 58% with inert solid*	5.2	UN 2147	Organic Peroxide	II	1	5	
Dicetyl peroxydicarbonate *maximum concentration 42%, stable dispersion in water*	5.2	UN 2895	Organic Peroxide	II	1	5	Control temperature 25 deg C. Emergency temperature 30 deg C
Dicetyl peroxydicarbonate, *technical pure*	5.2	UN 2164	Organic Peroxide	II	1	5	Control temperature 20 deg C. Emergency temperature 25 deg C
Dichloroacetic acid	8	UN 1764	Corrosive	II	1,2	1,2	Glass carboy in hampers not permitted under deck
1,3-Dichloroacetone	6.1	UN 2649	Poison	II	1,3	1	Keep cool. Stow 'away from' living quarters
Dichloroacetyl chloride	8	UN 1765	Corrosive	II	1	5	Keep dry
Dichloroanilines	6.1	UN 1590	Poison	II	1,2	1,2	Stow 'away from' acids
o-Dichlorobenzene	6.1	UN 1591	St. Andrews Cross	III	1,2	1,2	
p-Dichlorobenzene	6.1	UN 1592	St. Andrews Cross	III	1,2	1,2	
Di-(4-chlorobenzoyl) peroxide, *maximum concentration 52% as a paste*	5.2	UN 2114	Organic Peroxide	II	1	5	
Di-(4-chlorobenzoyl) peroxide, *maximum concentration 52% in solution*	5.2	UN 2115	Organic Peroxide	II	1	5	

AVAILABLE

Optional Hazardous Materials Table—Continued

(1) Notes and Symbols	(2) Hazardous Materials Description and Proper Shipping Names	(3) IMO Class	(4) Identification Number	(5) Label(s) required	(6) Packaging Group	(7) Vessel Stowage Requirements (a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Di-(4-chlorobenzoyl) peroxide, *maximum concentration 75% with water*	5.2	UN 2113	Organic Peroxide	II	1	5	
	Dichlorodifluoromethane	2.2	UN 1028	Nonflammable Gas	--	1,2	1,2	
	Dichlorodifluoromethane and difluoroethane, azeotropic mixture, *with approximately 74% dichlorodifluoromethane*	2.2	UN 2602	Nonflammable Gas	--	1,2	1,2	
	Dichlorodimethyl ether, symmetrical	6.1	UN 2249	Poison, Flammable Liquid	I	1	5	Stow 'away from' living quarters
	1,1-Dichloroethane	3.2	UN 2362	Flammable Liquid	II	1,2	1	
	Dichloroethylene	3.2	UN 1150	Flammable Liquid	II	1,2	1	
	Dichloroethyl ether	6.1	UN 1916	Poison	II	1,2	1,2	
	Dichloroisocyanuric acid, dry *or* Dichloroisocyanuric acid salts	5.1	UN 2465	Oxidizer	II	1,2	1,2	
	Dichloroisopropyl ether	6.1	UN 2490	Poison	II	1,2	1	
	Dichloromethane	6.1	UN 1593	St. Andrews Cross	III	1,2	1,2	Shade from radiant heat
	Dichloromonofluoromethane	2.2	UN 1029	Nonflammable Gas	--	1,2	1,2	
	1,1-Dichloro-1-nitroethane	6.1	UN 2650	Poison	II	1,3	1,3	Keep cool. Stow 'away from' living quarters
	Dichloropentanes	3.3	UN 1152	Flammable Liquid	II	1,2	1,2	
	Dichlorophenyl isocyanates	6.1	UN 2250	Poison	II	1,3	1,3	Shade from radiant heat. Stow 'away from' living quarters
	Dichlorophenyl trichlorosilane	8	UN 1766	Corrosive	II	1	1	Keep dry
	1,3-Dichloropropanol-2	6.1	UN 2750	Poison	II	1,3	1,3	Keep cool. Stow 'away from' living quarters
	Dichloropropene	3.3	UN 2047	Flammable Liquid	II	1,2	1,2	
	Dichlorosilane	2.3	UN 2189	Poison Gas, Flammable Gas	--	1	5	Stow 'away from' living quarters
	Dichlorotetrafluoroethane	2.2	UN 1958	Nonflammable Gas	--	1,2	1,2	
	Dicumyl peroxide, *technical pure or with inert solid*	5.2	UN 2121	Organic Peroxide	II	1	5	
	Dicyclohexylamine	8	UN 2565	Corrosive	III	1	5	Keep dry
	Dicyclohexylammonium nitrate	6.1	UN 2687	St. Andrews Cross	III	1,2	1,2	
	Dicyclohexyl peroxydicarbonate, *maximum concentration 91% with water*	5.2	UN 2153	Organic Peroxide	I	1	5	Control temperature 5 deg C. Emergency temperature 10 deg C
	Dicyclohexyl peroxydicarbonate, *technical pure*	5.2	UN 2152	Organic Peroxide	I	1	5	Control temperature 5 deg C. Emergency temperature 10 deg C
	Dicyclopentadiene	3.3	UN 2048	Flammable Liquid	II	1,2	1,2	
	Didecanoyl peroxide, *technical pure*	5.2	UN 2120	Organic Peroxide	II	1	5	Control temperature 15 deg C. Emergency temperature 20 deg C

	2,2-Di-(4,4-di-tert-butylperoxy cyclohexyl) propane, *maximum concentration 42% with inert solid*	5.2	UN 2168	Organic Peroxide	II	1	5	
	Di-2,4-dichlorobenzoyl peroxide, *maximum concentration 75% with water*	5.2	UN 2137	Organic Peroxide	II	1	5	
	Di-2,4-dichlorobenzoyl peroxide, *maximum concentration 52% as a paste*	5.2	UN 2138	Organic Peroxide	II	1	5	
	Di-2,4-dichlorobenzoyl peroxide, *maximum concentration 52% in solution*	5.2	UN 2139	Organic Peroxide	II	1	5	
	1,2-Di-(dimethylamino)-ethane	3.2	UN 2372	Flammable Liquid	II	1,2	1	
	Didymium nitrate	5.1	UN 1465	Oxidizer	III	1,2	1,2	
	Diethoxymethane	3.1	UN 2373	Flammable Liquid	II	1,3	5	Keep cool
	3,3-Diethoxypropene	3.2	UN 2374	Flammable Liquid	II	1,2	1	
	Diethylaluminium chloride	4.2	UN 1101	Spontaneously Combustible	I	1	1	
	Diethylamine	3.1	UN 1154	Flammable Liquid	II	1,3	5	Keep cool
	Diethylaminoethanol	3.3	UN 2686	Flammable Liquid	III	1,2	1,2	
	3-(Diethylamino) propylamine	8	UN 2684	Corrosive, Flammable Liquid	III	1,2	1,2	Segregation same as for flammable liquids
	N,N-Diethylaniline	6.1	UN 2432	St. Andrews Cross	III	1,2	1,2	
	Diethylbenzene	3.3	UN 2049	Flammable Liquid	II	1,2	1,2	
	Diethylcarbinol	3.3	UN 2706	Flammable Liquid	II	1,2	1,2	
	Diethyl carbonate	3.3	UN 2366	Flammable Liquid	II	1,2	1,2	
	Diethyl dichlorosilane	8	UN 1767	Corrosive, Flammable Liquid	II	1	1	Keep dry. Seperate longitudinally by an intervening compartment or hold from explosives. Segregation same as for flammable liquids
	N,N-Diethylene diamine	8	UN 2685	Corrosive, Flammable Liquid	II	1,3	1,3	Keep cool. Segregation same as for flammable liquids
N	Diethyleneglycol dinitrate, desensitized *with not less than 25% nonvolatile water-insoluble phlegmatizer, by weight*	1.1D	UN 0075	Explosive (1.1D)	--	--	--	
	Diethylenetriamine	8	UN 2079	Corrosive	II	1,2	1,2	Stow 'away from' acids, copper and copper alloys, and living quarters; 'separated from' nitric acid
	Diethyl ether	3.1	UN 1155	Flammable Liquid	I	1,3	5	Keep cool
	Di-(2-ethylhexyl) peroxydicarbonate, *maximum concentration 77% in solution*	5.2	UN 2123	Organic Peroxide	II	1	5	Control temperature −15 deg C. Emergency temperature −5 deg C
	Di-(2-ethylhexyl) peroxydicarbonate, *maximum concentration 32%, stable dispersion in water*	5.2	UN 2960	Organic Peroxide	II	1	5	Control temperature −10 deg C. Emergency temperature 0 deg C
	Di-(2-ethylhexyl) peroxydicarbonate, *technical pure*	5.2	UN 2122	Organic Peroxide	II	1	5	Control temperature −20 deg C. Emergency temperature −10 deg C
	Diethyl ketone	3.2	UN 1156	Flammable Liquid	II	1,2	1	
	Diethylmagnesium	4.2	UN 1367	Spontaneously Combustible	I	1	5	Prohibited on any ship carrying explosives (except explosives in Division 1.4, Compatibility Group S)
	Diethyl-p-nitrosoaniline	4.2	--	Spontaneously Combustible	--	1,2	5	Stow 'away from' foodstuff
	Diethyl peroxydicarbonate, *maximum concentration 27% in solution*	5.2	UN 2175	Organic Peroxide	II	1	5	Control temperature −10 deg C. Emergency temperature 0 deg C

AVAILABLE

Optional Hazardous Materials Table—Continued

(1)	(2)	(3)	(4)	(5)	(6)	(7) Vessel Stowage Requirements		
Notes and Symbols	Hazardous Materials Description and Proper Shipping Names	IMO Class	Identification Number	Label(s) required	Packaging Group	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Diethyl sulfide	3.2	UN 2375	Flammable Liquid, Poison	II	1,3	5	Keep cool and dry
	Diethyl sulphate	6.1	UN 1594	Poison	II	1	1	
	Diethylthiophosphoryl chloride	8	UN 2751	Corrosive, Flammable Liquid	II	1	5	Keep cool and dry. Segregation same as for flammable liquids
	Diethylzinc	4.2	UN 1366	Spontaneously Combustible	I	1	5	Prohibited on any ship carrying explosives (except explosives in Division 1.4, Compatibility Group S)
	1,1-Difluoroethane	2.1	UN 1030	Flammable Gas	--	1,2	1	Stow 'away from' living quarters
	1,1-Difluoroethylene	2.1	UN 1959	Flammable Gas	--	1,2	5	Stow 'away from' living quarters
	Difluoromonochloroethane. *See* Chlorodifluoroethanes							
	Difluorophosphoric acid, *anhydrous*	8	UN 1768	Corrosive	II	1,2	1,2	
	2,2-Dihydroperoxy propane, *maximum concentration 25% with inert inorganic solid*	5.2	UN 2178	Organic Peroxide	II	1	5	
	2,3-Dihydropyran	3.2	UN 2376	Flammable Liquid	II	1,2	1	
	Di-(1-hydroxy cyclohexyl) peroxide, *technical pure*	5.2	UN 2148	Organic Peroxide	II	1	5	
	Diisobutylamine	3.3	UN 2361	Flammable Liquid	II	1,2	1,2	
	Diisobutylene, *(isomeric compounds)*	3.2	UN 2050	Flammable Liquid	II	1,2	1	
	Diisobutyl ketone	3.3	UN 1157	Flammable Liquid	III	1,2	1,2	
	Diisooctyl acid phosphate	8	UN 1902	Corrosive	III	1,2	1,2	Glass carboys in hampers not permitted under deck
	Diisopropylamine	3.2	UN 1158	Flammable Liquid	II	1,2	1	
	Diisopropylbenzene hydroperoxide, *maximum concentration 72% in solution*	5.2	UN 2171	Organic Peroxide	I	1	5	
	N,N-Diisopropyl ethanolamine	8	UN 2825	Corrosive	III	1,2	1,2	Stow 'away from' caustic alkalis
	Diisopropyl ether	3.1	UN 1159	Flammable Liquid	II	1,3	5	Keep cool
	Diisopropyl peroxydicarbonate, *technical pure*	5.2	UN 2133	Organic Peroxide	II	1	5	Control temperature −15 deg C. Emergency temperature −5 deg C
	Diisopropyl peroxydicarbonate, *maximum concentration 52% in solution*	5.2	UN 2134	Organic Peroxide	II	1	5	Control temperature −10 deg C. Emergency temperature 0 deg C
	Diisotridecyl peroxydicarbonate, *technical pure*	5.2	UN 2889	Organic Peroxide	II	1	5	Control temperature −10 deg C. Emergency temperature 0 deg C
	Diketene, inhibited	3.3	UN 2521	Flammable Liquid	II	1,2	1,2	
	Dilauroyl peroxide, *maximum concentration 42%, stable dispersion in water*	5.2	UN 2893	Organic Peroxide	II	1	5	

Dilauroyl peroxide, *technical pure*	5.2	UN 2124	Organic Peroxide	II	1	5	
1,1-Dimethoxyethane	3.1	UN 2377	Flammable Liquid	II	1,3	5	Keep cool
	3.2	UN 2377	Flammable Liquid	II	1,2	1	
1,2-Dimethoxyethane	3.2	UN 2252	Flammable Liquid	II	1,2	1	
Dimethylamine, *anhydrous*	2.1	UN 1032	Flammable Gas	--	1,2	5	Stow 'away from' living quarters
Dimethylamine, solution	3.2	UN 1160	Flammable Liquid	II	1,2	1	
2-Dimethylaminoacetonitrile	3.3	UN 2378	Flammable Liquid, Poison	II	1,2	1,2	
Dimethylaminoethyl methacrylate	6.1	UN 2522	Poison	II	1,2	1	
N,N-Dimethylaniline	6.1	UN 2253	Poison	II	1,3	1,3	Stow 'away from' sources of heat
Di-(2-methylbenzoyl)peroxide, *with at least 15% water*	5.2	UN 2593	Organic Peroxide	I	1	5	Control temperature 30 deg C. Emergency temperature 35 deg C
2,3-Dimethylbutane	3.1	UN 2457	Flammable Liquid	II	1,3	5	Keep cool
1,3-Dimethylbutylamine	3.2	UN 2379	Flammable Liquid	II	1,2	1	
N,N-Dimethylcarbamoyl chloride	8	UN 2262	Corrosive	II	1,2	1,2	
Dimethyl carbonate	3.2	UN 1161	Flammable Liquid	II	1,2	1	
Dimethylcyclohexanes	3.2	UN 2263	Flammable Liquid	II	1,2	1	
N N-Dimethylcyclohexylamine	8	UN 2264	Corrosive, Flammable Liquid	II	1,3	1,3	Keep cool. Segregation same as for flammable liquids
2,5-Dimethyl-2,5-di-(benzoylperoxy) hexane, *maximum concentration 82% with water*	5.2	UN 2959	Organic Peroxide	II	1	5	
2,5-Dimethyl-2,5-di-(benzoylperoxy) hexane, *maximum concentration 82% with inert solid*	5.2	UN 2173	Organic Peroxide	II	1	5	
2,5-Dimethyl-2,5-di-(benzoylperoxy) hexane, *technical pure*	5.2	UN 2172	Organic Peroxide	II	1	5	
2,5-Dimethyl-2,5-di-(tert-butylperoxy) hexane, *maximum concentration 52% with inert solid*	5.2	UN 2156	Organic Peroxide	II	1	5	
2,5-Dimethyl-2,5-di-(tert-butylperoxy) hexane, *technical pure*	5.2	UN 2155	Organic Peroxide	II	1	5	
2,5-Dimethyl-2,5-di-(tert-butylperoxy) hexyne-3, *maximum concentration 52% with inert solid*	5.2	UN 2159	Organic Peroxide	II	1	5	
2,5-Dimethyl-2,5-di-(tert-butylperoxy) hexyne-3, *technical pure*	5.2	UN 2158	Organic Peroxide	II	1	5	
Dimethyldichlorosilane	3.2	UN 1162	Flammable Liquid, Corrosive	I	1,2	1	
Dimethyldiethoxysilane	3.2	UN 2380	Flammable Liquid	II	1,2	1	
2,5-Dimethyl-2,5-di -(2-ethylhexanoylperoxy) hexane, *technical pure*	5.2	UN 2157	Organic Peroxide	II	1	5	Control temperature 20 deg C. Emergency temperature 25 deg C
2,5-Dimethyl-2,5-dihydroperoxy hexane, *maximum concentration 82% with water*	5.2	UN 2174	Organic Peroxide	I	1	5	
Dimethyldioxanes	3.2	UN 2707	Flammable Liquid	II	1,2	1	
Dimethyldioxanes	3.3	UN 2707	Flammable Liquid	II	1,2	1,2	
Dimethyl disulfide	3.2	UN 2381	Flammable Liquid	II	1,2	1	
Dimethylethanolamine	3.3	UN 2051	Flammable Liquid	II	1,3	1,3	
Dimethyl ether	2.1	UN 1033	Flammable Gas	–	1,2	1	Stow 'away from' living quarters
N,N-Dimethylformamide	3.3	UN 2265	Flammable Liquid	III	1,2	1,2	
Dimethylhydrazine, *symmetrical*	3.2	UN 2382	Flammable Liquid, Poison	I	1,3	5	Keep cool

Optional Hazardous Materials Table—Continued

(1) Notes and Symbols	(2) Hazardous Materials Description and Proper Shipping Names	(3) IMO Class	(4) Identification Number	(5) Label(s) required	(6) Packaging Group	(7) Vessel Stowage Requirements (a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Dimethylhydrazine, unsymmetrical	3.2	UN 1163	Flammable Liquid, Corrosive	I	1,2	1	Stow 'separated from' corrosive liquids and oxidizers
	Dimethylmagnesium	4.2	UN 1368	Spontaneously Combustible	I	1	5	Prohibited on any ship carrying explosives (except explosives in Division 1.4, Compatibility Group S)
	Dimethyl-p-nitrosoaniline. *See* p-Nitrosodimethylaniline							
	2,2-Dimethylpropane *other than pentane and isopentane*	2.1	UN 2044	Flammable Gas	–	1,2	1	
	Dimethyl-N-propylamine	3.2	UN 2266	Flammable Liquid, Corrosive	II	1,2	1	
	Dimethyl sulphate	6.1	UN 1595	Poison	I	1	5	Stow 'away from' living quarters
	Dimethyl sulphide	3.1	UN 1164	Flammable Liquid	I	1,3	5	Keep cool
	Dimethyl thiophosphoryl chloride	8	UN 2267	Corrosive	III	1,2	1	Keep dry. Shade from radiant heat. Glass carboys prohibited on passenger vessels
	Dimethylzinc	4.2	UN 1370	Spontaneously Combustible	I	1	5	Prohibited on any ship carrying explosives (except explosives in Division 1.4, Compatibility Group S)
	Dimyristylperoxydicarbonate, *maximum concentration 22%, stable dispersion in water*	5.2	UN 2892	Organic Peroxide	II	1	5	Control temperature 20 deg C. Emergency temperature 25 deg C
	Dimyristylperoxydicarbonate, *technical pure*	5.2	UN 2595	Organic Peroxide	II	1	5	Control temperature 20 deg C. Emergency temperature 25 deg C
	Dinitroanilines	6.1	UN 1596	Poison	II	1,2	1,2	
	Dinitrobenzenes *(o-, m-, p-)*	6.1	UN 1597	Poison	II	1,2	1,2	
	Dinitro-o-cresol, *liquid*	6.1	UN 1598	Poison	I	1	1	
		6.1	UN 1598	Poison	II	1,2	1	
		6.1	UN 1598	St. Andrews Cross	III	1,2	1,2	
	Dinitro-o-cresol, *solid*	6.1	UN 1598	Poison	I/II	1,2	1,2	
		6.1	UN 1598	St. Andrews Cross	III	1,2	1,2	
	Dinitrogen tetroxide. *See* Nitrogen dioxide							
N	Dinitrophenates *alkali metals, dry or wetted with less than 15% water, by weight*	1.3C	UN 0077	Explosive (1.3C), Poison	–	–	–	
	Dinitrophenolates, *wetted with, by weight, at least 15% water*	4.1	UN 1321	Flammable Solid, Poison	I	1,2	5	Stow 'away from' heavy metals and their compounds
N	Dinitrophenol, *dry or wetted with less than 15% water, by weight*	1.1D	UN 0076	Explosive (1.1D), Poison	–	–	–	

	Dinitrophenol, solution *in water or flammable liquid*	6.1	UN 1599	Poison, Flammable Liquid (only if flashpoint between 23 deg C and 61 deg C)	II	1,2	5	Stow 'away from' heavy metals and their compounds. Segregation same as for flammable liquids if flash point below 61 deg C
	Dinitrophenol, wetted with, *by weight, at least 15% water*	4.1	UN 1320	Flammable Solid, Poison	I	1,2	5	Stow 'away from' heavy metals and their compounds and sodium compounds
N	Dinitroresorcinol, *dry or wetted with less than 15% water*	1.1D	UN 0078	Explosive (1.1D)	–	–	–	
	Dinitroresorcinol, wetted with, *by weight, at least 15% water*	4.1	UN 1322	Flammable Solid	I	1,2	5	Stow 'away from' heavy metals and their compounds
N	Dinitrosobenzene	1.3C	UN 0406	Explosive (1.3C)	–	–	–	
	Dinitrotoluenes, molten	6.1	UN 1600	Poison	II	1,2	1,2	
	Dinitrotoluenes, solid	6.1	UN 2038	Poison	II	1,2	1,2	
	Di-n-nonanoyl peroxide, *technical pure*	5.2	UN 2130	Organic Peroxide	II	1	5	Control temperature 0 deg C. Emergency temperature 10 deg C
	Di-n-octanoyl peroxide, *technical pure*	5.2	UN 2129	Organic Peroxide	II	1	5	Control temperature 10 deg C. Emergency temperature 15 deg C
	Dioxane	3.2	UN 1165	Flammable Liquid	II	1,2	1	
	Dioxolane	3.2	UN 1166	Flammable Liquid	II	1,2	1	
	Dipentene	3.3	UN 2052	Flammable Liquid	II	1,2	1,2	
	Diperoxyazelaic acid, *maximum concentration 27%, with not less than 13% azelaic acid and not less than 58% sodium sulphate*	5.2	UN 2958	Organic Peroxide	II	1	5	Control temperature 35 deg C. Emergency temperature 40 deg C
	Diphenylaminechloroarsine	6.1	UN 1698	Poison	I	1	5	
	Diphenylchloroarsine	6.1	UN 1699	Poison	I	1	5	Stow 'away from' living quarters
	Diphenyl dichlorosilane	8	UN 1769	Corrosive	II	1	1	Keep dry
	Diphenylmethane-4,4'diisocyanate	6.1	UN 2489	St. Andrews Cross	III	1,2	1,2	Stow 'away from' sources of heat
	Diphenylmethyl bromide	8	UN 1770	Corrosive	II	1	5	
N	Dipicryl sulfide, *dry or wetted with less than 10% water, by weight*	1.1D	UN 0401	Explosive (1.1D)	–	–	–	
	Dipicryl sulphide, wetted with, *by weight, at least 10% water*	4.1	UN 2852	Flammable Solid	I	1	5	
	Dipropionyl peroxide, *maximum concentration 28% in solution*	5.2	UN 2132	Organic Peroxide	II	1	5	Control temperature 15 deg C. Emergency temperature 20 deg C
	Dipropylamine	3.2	UN 2383	Flammable Liquid	II	1,2	1	
	Dipropyl ether	3.1	UN 2384	Flammable Liquid	II	1,3	5	Keep cool
	Dipropylketone	3.3	UN 2710	Flammable Liquid	III	1,2	1,2	
	Di-n-propyl peroxydicarbonate, *technical pure*	5.2	UN 2176	Organic Peroxide	I	1	5	Control temperature −25 deg C. Emergency temperature -−15 deg C
	Disinfectants, corrosive, liquid, n.o.s.	8	UN 1903	Corrosive	II	1,2	1,2	
	Disinfectants, n.o.s., *poisonous, liquid or solid*	6.1 6.1 6.1	UN 1601 UN 1601 UN 1601	Poison Poison St. Andrews Cross	I II III	1,2 1,2 1,2	1 1,2 1,2	
	Distearylperoxydicarbonate, *with 13% stearyl alcohol*	5.2	UN 2592	Organic Peroxide	II	1	5	
	Disuccinic acid peroxide, *maximum concentration 72%, wetted with water*	5.2	UN 2962	Organic Peroxide	I	1	5	Control temperature 10 deg C. Emergency temperature 15 deg C
	Disuccinic acid peroxide, *technical pure*	5.2	UN 2135	Organic Peroxide	I	1	5	

Optional Hazardous Materials Table—Continued

(1)	(2)	(3)	(4)	(5)	(6)	(7) Vessel Stowage Requirements		
Notes and Symbols	Hazardous Materials Description and Proper Shipping Names	IMO Class	Identification Number	Label(s) required	Packaging Group	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Dithiocarbamate pesticides, liquid, flammable, toxic, n.o.s., *flashpoint less than 23 deg C*	3.2	UN 2772	Flammable Liquid and Poison or St. Andrews Cross (according to toxicity)	I/II	1,2	1	
	Dithiocarbamate pesticides, liquid, toxic, flammable, n.o.s., *flashpoint between 23 deg C and 61 deg C*	6.1	UN 3005	Poison, Flammable Liquid	I	1	1	Segregation same as for flammable liquids
		6.1	UN 3005	Poison, Flammable Liquid	II	1,2	1	Segregation same as for flammable liquids
		6.1	UN 3005	St. Andrews Cross, Flammable Liquid	III	1,2	1,2	Segregation same as for flammable liquids
	Dithiocarbamate pesticides, liquid, toxic, n.o.s.	6.1	UN 3006	Poison	I	1	1	
		6.1	UN 3006	Poison	II	1,2	1	
		6.1	UN 3006	St. Andrews Cross	III	1,2	1,2	
	Dithiocarbamate pesticides, solid, toxic, n.o.s.	6.1	UN 2771	Poison	I/II	1,2	1,2	
		6.1	UN 2771	St. Andrews Cross	III	1,2	1,2	
	Di-(3,5,5-trimethyl-1,2-dioxolanyl-3)peroxide, *as a paste with at least 50% phlegmatizer*	5.2	UN 2597	Organic Peroxide	II	1	5	Control temperature 30 deg C. Emergency temperature 35 deg C
	Di-(3,5,5-trimethylhexanoyl)peroxide, *technical pure or in solution*	5.2	UN 2128	Organic Peroxide	II	1	5	Control temperature 0 deg C. Emergency temperature 10 deg C
	Divinyl ether, inhibited	3.1	UN 1167	Flammable Liquid	II	1,3	5	Keep cool
	Dodecyl trichlorosilane	8	UN 1771	Corrosive	II	1	1	Keep dry
	Dressing, leather. *See* Flammable liquid preparations, n.o.s.							
	Driers, *paint or varnish*, liquid, n.o.s.	3.2	UN 1168	Flammable Liquid	II	1,2	1	
		3.3	UN 1168	Flammable Liquid	II	1,2	1,2	
	Driers, *paint or varnish*, solid, n.o.s.	4.1	UN 1371	Flammable Solid	III	1,2	1,2	
	Dyes, n.o.s. *or* Dye intermediates, n.o.s., *liquid or solid, corrosive*	8	UN 2801	Corrosive, Flammable Liquid (only if flashpoint between 23 and 61 deg C)	II/III	1,2	1,2	Segregation same as for flammable liquids, if flashpoint between 23 and 61 deg C
	Dyes, n.o.s. *or* Dye intermediates, n.o.s., *liquid or solid, poisonous*	6.1	UN 1602	Poison	I	1,2	1	
		6.1	UN 1602	Poison	II	1,2	1,2	
		6.1	UN 1602	St. Andrews Cross	III	1,2	1,2	
	Enamels. *See* Paints, *etc.*							
	Engine starting fluid, *with flammable gas*	2.1	UN 1960	Flammable Gas	--	1,2	5	Stow 'away from' living quarters

Epibromohydrin	6.1	UN 2558	Poison, Flammable Liquid	I	1	5	Stow 'away from' living quarters. Segregation same as for flammable liquids. Shade from radiant heat
Epichlorohydrin	6.1	UN 2023	Poison, Flammable Liquid	II	1,2	1,2	Segregation same as for flammable liquids. Stow 'away from' living quarters
1,2-Epoxy-3-ethyloxy propane	3.3	UN 2752	Flammable Liquid	III	1,2	1,2	
Eradicators, *paint or grease, liquid. To be classified and labeled according to the principle hazardous constituent*	--	UN 1850		--	1,2	1	
Essences. *See* Extracts, aromatic, liquid							
Ethane, *compressed*	2.1	UN 1035	Flammable Gas	--	1,2	5	
Ethane, *refrigerated liquid*	2.1	UN 1961	Flammable Gas	--	1	5	
Ethanolamine *or* Ethanolamine solutions	8	UN 2491	Corrosive	III	1,2	1,2	
Ethanol *or* Ethanol solutions *including* Alcoholic beverages	3.2 3.3	UN 1170 UN 1170	Flammable Liquid Flammable Liquid	II III	1,2 1,2	1 1,2	
Ether. *See* Diethyl ether							
Ethyl acetate	3.2	UN 1173	Flammable Liquid	II	1,2	1	
Ethyl acetylene, inhibited	2.1	UN 2452	Flammable Gas	--	1	5	
Ethyl acrylate, *inhibited*	3.2	UN 1917	Flammable Liquid	II	1,2	1	
Ethyl alcohol. *See* Ethanol							
Ethyl aldehyde. *See* Acetaldehyde							
Ethyl aluminium dichloride	4.2	UN 1924	Spontaneously Combustible	I	1	1	
Ethyl aluminium sesquichloride	4.2	UN 1925	Spontaneously Combustible	I	1	1	
Ethylamine	2.1	UN 1036	Flammable Gas	--	1,2	5	
Ethylamine solution *in water, concentrations up to 70%*	3.1 3.2 3.3	UN 2270 UN 2270 UN 2270	Flammable Liquid Flammable Liquid Flammable Liquid	II II III	1,3 1,2 1,2	5 1,2 1,2	Keep cool
Ethyl amyl ketone	3.3	UN 2271	Flammable Liquid	III	1,2	1,2	
N-Ethylaniline	6.1	UN 2272	St. Andrews Cross	III	1,2	1,2	Stow 'away from' acids
2-Ethylaniline	6.1	UN 2273	St. Andrews Cross	III	1,2	1,2	
Ethylbenzene	3.2	UN 1175	Flammable Liquid	II	1,2	1,2	
N-Ethyl-n-benzylaniline	6.1	UN 2274	St. Andrews Cross	III	1,2	1,2	Stow 'away from' living quarters
N-ethylbenzyltoluidines	6.1	UN 2753	St. Andrews Cross	III	1,3	1,3	Keep cool
Ethyl borate	3.2	UN 1176	Flammable Liquid	II	1,2	1	
Ethyl bromide	6.1	UN 1891	Poison	II	1,3	1	Stow 'away from' sources of heat
Ethyl bromoacetate	6.1	UN 1603	Poison, Flammable Liquid	II	1	5	Stow 'away from' living quarters. Segregation same as for flammable liquids
2-Ethylbutanol	3.3	UN 2275	Flammable Liquid	III	1,2	1,2	
Ethylbutyl acetate	3.3	UN 1177	Flammable Liquid	III	1,2	1,2	
Ethyl butyl ether	3.2	UN 1179	Flammable Liquid	II	1,2	1	
2-Ethylbutyraldehyde	3.2	UN 1178	Flammable Liquid	II	1,2	1	
Ethyl butyrate	3.3	UN 1180	Flammable Liquid	II	1,2	1,2	
Ethyl chloride	2.1	UN 1037	Flammable Gas	--	1,2	5	Stow 'away from' living quarters

Optional Hazardous Materials Table—Continued

(1)	(2)	(3)	(4)	(5)	(6)	(7) Vessel Stowage Requirements		
Notes and Symbols	Hazardous Materials Description and Proper Shipping Names	IMO Class	Identification Number	Label(s) required	Packaging Group	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Ethyl chloroacetate	6.1	UN 1181	Poison, Flammable Liquid	II	1,2	1,2	Segregation same as for flammable liquids. Stow 'away from' sources of heat and living quarters
	Ethyl chlorocarbonate. See Ethyl ch'oroformate							
	Ethyl chloroformate	3.2	UN 1182	Flammable Liquid, Poison, Corrosive	I	1,2	1	
	Ethyl-2-chloropropionate	3.3	UN 2935	Flammable Liquid	III	1,2	1,2	
	Ethyl chlorothioformate	8	UN 2826	Corrosive, Flammable Liquid	II	1,2	1,2	Segregation same as for flammable liquids
	Ethyl crotonate	3.2	UN 1862	Flammable Liquid	II	1,2	1	
	Ethyl cyanoacetate	6.1	UN 2666	St. Andrews Cross	III	1,2	1,2	Stow 'away from' acids
	Ethyl-3,3-di-(tert-butylperoxy) butyrate, *maximum concentration 77% in solution*	5.2	UN 2185	Organic Peroxide	II	1	5	
	Ethyl-3,3-di-(tert-butylperoxy) butyrate, *technical pure*	5.2	UN 2184	Organic Peroxide, Explosive (May not be required under certain conditions. See IMDG Code)	II	1	5	
	Ethyl-3,3-di(tert-butylperoxy)butyrate, *with at least 50% inert, inorganic solid*	5.2	UN 2598	Organic Peroxide	II	1	5	
	Ethyl dichloroarsine	6.1	UN 1892	Poison	I	1	5	Stow 'away from' living quarters
	Ethyldichlorosilane	3.2	UN 1183	Flammable Liquid, Corrosive	II	1,2	1	
	Ethylene chlorohydrin	6.1	UN 1135	Poison, Flammable Liquid	II	1,2	1,2	Segregation same as for flammable liquids. Stow 'away from' living quarters and sources of heat
	Ethylene, *compressed*	2.1	UN 1962	Flammable Gas	--	1,2	5	Stow 'away from' living quarters
	Ethylenediamine	8	UN 1604	Corrosive, Flammable Liquid	II	1,2	1,2	Segregation same as for flammable liquids
	Ethylene dibromide	6.1	UN 1605	Poison	II	1,2	1,2	Stow 'away from' living quarters
	Ethylene dichloride	3.2	UN 1184	Flammable Liquid, Poison	II	1,2	1	
	Ethylene glycol diethyl ether	3.3	UN 1153	Flammable Liquid	III	1,2	1,2	
	Ethylene glycol monobutyl ether	6.1	UN 2369	St. Andrews Cross, Flammable Liquid (only if flashpoint below 61 deg C)	III	1,3	1,3	Shade from radiant heat. Stow 'away from' living quarters. If flashpoint below 61 deg C, segregation same as for flammable liquids

	Ethylene glycol monoethyl ether	3.3	UN 1171	Flammable Liquid	III	1,2	1,2	
	Ethylene glycol monoethyl ether acetate	3.3	UN 1172	Flammable Liquid	III	1,2	1,2	
	Ethylene glycol monomethyl ether	3.3	UN 1188	Flammable Liquid	III	1,2	1,2	
	Ethylene glycol monomethyl ether acetate	3.3	UN 1189	Flammable Liquid	III	1,2	1,2	
	Ethyleneimine, *inhibited*	3.2	UN 1185	Flammable Liquid, Poison	I	1,2	1	
	Ethylene oxide and carbon dioxide, mixtures. See Carbon dioxide and ethylene oxide mixtures							
	Ethylene oxide and propylene oxide mixtures, *not more than 30% ethylene oxide*	3.1	UN 2983	Flammable Liquid, Poison	I	1,3	5	Keep cool
	Ethylene oxide, *containing not more than 0.2% of nitrogen*	2.1	UN 1040	Flammable Gas, Poison Gas	--	1,2	1	Stow 'away from' living quarters
	Ethylene, *refrigerated liquid*	2.1	UN 1038	Flammable Gas	--	1	5	Stow 'away from' living quarters
	Ethyl ether. *See* Diethyl ether							
	Ethyl fluid. *See* Motor fuel antiknock mixtures							
	Ethyl fluoride	2.1	UN 2453	Flammable Gas	--	1,2	5	
	Ethyl formate	3.1	UN 1190	Flammable Liquid	II	1,3	5	Keep cool
	Ethyl hexaldehyde	3.3	UN 1191	Flammable Liquid	III	1,2	1,2	
	2-Ethylhexylamine	8	UN 2276	Corrosive, Flammable Liquid	III	1,2	1,2	Segregation same as for flammable liquids
	2-Ethylhexylchloroformate	6.1	UN 2748	Poison, Corrosive	II	1,3	1,3	Keep cool and dry. Shade from radiant heat. Stow 'away from' living quarters
	Ethylisobutyrate	3.2	UN 2385	Flammable Liquid	II	1,2	1	
	Ethyl isocyanate	3.2	UN 2481	Flammable Liquid, Poison	I	1	5	Keep cool. Stow 'away from' living quarters and sources of heat
	Ethyl lactate	3.3	UN 1192	Flammable Liquid	III	1,2	1,2	
	Ethyl mercaptan	3.1	UN 2363	Flammable Liquid, Poison	II	1,3	5	Keep cool and dry. Stow 'separated from' foodstuffs and all odor absorbing cargo
	Ethyl methacrylate, inhibited	3.2	UN 2277	Flammable Liquid	II	1,2	1	
	Ethyl methyl ether	2.1	UN 1039	Flammable Gas	--	1,2	1	Stow 'away from' living quarters
	Ethyl methyl ketone	3.2	UN 1193	Flammable Liquid	II	1,2	1	
	Ethyl methyl ketone peroxide(s), *maximum concentration 60%*	5.2	UN 2127	Organic Peroxide	I	1	5	
	Ethyl methyl ketone peroxide(s), *maximum concentration 50%, containing not more than 10% available oxygen*	5.2	UN 2550	Organic Peroxide	I	1	5	
N	Ethyl methyl ketone peroxide(s), *maximum concentration 50%, containing more than 10% available oxygen*				--	--	--	
	Ethyl nitrite, solutions	3.1	UN 1194	Flammable Liquid	I	1,3	5	Keep cool
	Ethyl orthoformate	3.3	UN 2524	Flammable Liquid	II	1,2	1,2	
	Ethyl oxalate	6.1	UN 2525	St. Andrews Cross	III	1,2	1,2	
	Ethylphenyldichlorosilane	8	UN 2435	Corrosive	II	1	1	Keep dry
	1-Ethyl piperidine	3.2	UN 2386	Flammable Liquid	II	1,2	1	
	Ethyl propionate	3.2	UN 1195	Flammable Liquid	II	1,2	1	
	Ethyl propyl ether	3.1	UN 2615	Flammable Liquid	II	1,3	5	Keep cool
	Ethyl silicate. *See* Tetraethyl silicate							
	Ethylsulphuric acid	8	UN 2571	Corrosive	II	1,2	1	Keep dry. Metal drums only permitted under deck

Optional Hazardous Materials Table—Continued

(1) Notes and Symbols	(2) Hazardous Materials Description and Proper Shipping Names	(3) IMO Class	(4) Identification Number	(5) Label(s) required	(6) Packaging Group	(7) Vessel Stowage Requirements (a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	N-Ethyltoluidines *(o,m,p)*	6.1	UN 2754	Poison, Flammable Liquid (only if flashpoint below 61 deg C)	II	1,3	1,3	Keep cool. Shade from radiant heat. Stow 'away from' living quarters. If flashpoint below 61 deg C, segregation same as for Flammable liquids
	Ethyltrichlorosilane	3.2	UN 1196	Flammable Liquid, Corrosive	II	1,2	1	
N	Explosives, blasting, Type A	1.1D	UN 0081	Explosive (1.1D)	--	--	--	
	Explosives, blasting, Type B	1.5 D	UN 0331	Explosive (1.5D)	--	6	5	
N	Explosives, blasting, Type B	1.1D	UN 0082	Explosive (1.1D)	--	--	--	
N	Explosives, blasting, Type C	1.1D	UN 0083	Explosive (1.1D)	--	--	--	
N	Explosives, blasting, Type D	1.1D	UN 0084	Explosive (1.1D)	--	--	--	
	Explosives, blasting, Type E	1.5 D	UN 0332	Explosive (1.5D)	--	6	5	
N	Explosives, blasting, Type E	1.1D	UN 0241	Explosive (1.1D)	--	--	--	
	Extracts, aromatic, liquid	3.2 3.3	UN 1169 UN 1169	Flammable Liquid Flammable Liquid	II/III III	1,2 1,2	1 1,2	
	Extracts, flavouring, liquid	3.2 3.3	UN 1197 UN 1197	Flammable Liquid Flammable Liquid	II/III III	1,2 1,2	1 1,2	
	Fabric, animal or vegetable *See* Fibres, animal or vegetable							
	Ferric arsenate	6.1	UN 1606	Poison	II	1,2	1,2	
	Ferric arsenite	6.1	UN 1607	Poison	II	1,2	1,2	
	Ferric chloride, anhydrous	8	UN 1773	Corrosive	III	1,2	1,2	
	Ferric chloride, solution	8	UN 2582	Corrosive	III	1,2	1,2	
	Ferric nitrate	5.1	UN 1466	Oxidizer	III	1,2	1,2	
	Ferrocerium	4.1	UN 1323	Flammable Solid	II	1,2	1,2	
	Ferrosilicon, *containing more than 30% but less than 90% silicon*	4.3	UN 1408	Dangerous When Wet, Poison	III	1,2	1,2	Keep dry. When stowed under deck, stow in a mechanically ventilated space
	Ferrous arsenate	6.1	UN 1608	Poison	II	1,2	1,2	
	Ferrous metal borings, shavings, turnings, *or cuttings in a form liable to self heating*	4.2	UN 2793	Spontaneously Combustible	III	1,2	1,2	
	Fertilizer ammoniating solution, *containing free ammonia in excess of 35% ammonia*	2.2	UN 1043	Nonflammable Gas	--	1,2	5	Stow 'away from' living quarters
	Fibres, animal or vegetable, *burnt, wet or damp*	4.2	UN 1372	Spontaneously Combustible	III	1,2	1,2	

	Fibres *or* Fabric, animal *or vegetable, containing more than 5% of animal or vegetable oil*	4.2	UN 1373	Spontaneously Combustible	III	1,2	1,2	
	Fibres, *vegetable, dry*	4.1	--	None	--	1,2	1,2	Stow 'away from' animal or vegetable oils
	Fillers, *liquid. See* Paints, *etc.*							
	Film, motion picture, *nitrocellulose base, exposed and developed film, or unexposed or undeveloped film*	4.1	UN 1324	Flammable Solid	III	1,2	1,2	Stow 'away from' flammable substances. Maximum 250 Kg. net on deck on passenger vessels
	Film, motion picture, *nitrocellulose base, old film*	4.1	UN 1324	Flammable Solid	III	1	5	Stow 'away from' flammable substances
	Fire extinguisher charges, *corrosive liquid*	8	UN 1774	Corrosive	II	1,2	1,2	
	Fire extinguishers, *containing compressed or liquefied gas*	2.2	UN 1044	Nonflammable Gas	--	1,2	1,2	
	Firelighters, *solid, with a flammable liquid*	4.1	UN 2623	Flammable Solid	II/III	1,2	1,2	
N	Fireworks, Type A	1.1G	UN 0333	Explosive (1.1G)	--	--	--	
N	Fireworks, Type B	1.2G	UN 0334	Explosive (1.2G)	--	--	--	
N	Fireworks, Type C	1.3G	UN 0335	Explosive (1.3G)	--	--	--	
	Fireworks, Type D	1.4 G	UN 0336	Explosive (1.4G)	--	1,3	1,3	
	Fireworks, Type D	1.4 S	UN 0337	None. Package to be marked '1.4 S'	--	1,3	1,3	
	Fishmeal *or* fishscrap, *antioxidant treated, moisture content greater than 5% but not exceeding 12%, by weight, fat content not more than 15% by weight*	9	UN 2216	None	III	1,2	1,2	
	Fishmeal *or* fishscrap, *high hazard, unrestricted moisture content, unrestricted fat content in excess of 12% by weight; unrestricted fat content in excess of 15%, by weight, in the case of anti-oxidant treated fishmeal or fishscrap*	4.2	UN 1374	Spontaneously Combustible	II	1,2	1,2	
	Fishmeal *or* fishscrap, *not antioxidant treated, moisture content greater than 5% but not exceeding 12% by weight, fat content not exceeding 12% by weight*	4.2	UN 1374	None. Package to be marked 'Class 4.2'	III	1,2	1,2	Double strip stowage recommended. Provide good surface and through ventilation
	Flammable gas in lighters. See Lighters for cigars and cigarettes, etc. *with flammable gas*							
	Flammable liquid preparations, n.o.s.	3.2 3.3	UN 1142 UN 1142	Flammable Liquid Flammable Liquid	II II	1,2 1,2	1 1,2	
	Flammable liquids, corrosive, n.o.s.	3.1	UN 2924	Flammable Liquid, Corrosive	I/II	1,3	5	Keep cool. Stow 'away from' foodstuffs
		3.2	UN 2924	Flammable Liquid, Corrosive	I/II	1,2	1	
	Flammable liquids, n.o.s.	3.1 3.2 3.3	UN 1993 UN 1993 UN 1993	Flammable Liquid Flammable Liquid Flammable Liquid	I/II II II	1,3 1,2 1,2	5 1 1,2	Keep cool
	Flammable liquids, poisonous, n.o.s.	3.1 3.2 3.3	UN 1992 UN 1992 UN 1992	Flammable Liquid, Poison Flammable Liquid, Poison Flammable Liquid, Poison	I/II II II	1,3 1,2 1,2	5 1 1,2	Keep cool

Optional Hazardous Materials Table—Continued

(1)	(2)	(3)	(4)	(5)	(6)	(7)		
						Vessel Stowage Requirements		
Notes and Symbols	Hazardous Materials Description and Proper Shipping Names	IMO Class	Identification Number	Label(s) required	Packaging Group	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Flammable solids, corrosive, n.o.s.	4.1	UN 2925	Flammable Solid, Corrosive	I/II/III	1	5	Stow 'separated from' oxidizing substances
	Flammable solids, n.o.s.	4.1 4.1	UN 1325 UN 1325	Flammable Solid Flammable Solid	I II/III	1,2 1,2	5 1	
	Flammable solids, poisonous, n.o.s.	4.1 4.1	UN 2926 UN 2926	Flammable Solid Flammable Solid	I II	1,2 1,2	5 1	
N	Flares, aerial	1.1G	UN 0420	Explosive (1.1G)	–	–	–	
N	Flares, aerial	1.2G	UN 0421	Explosive (1.2G)	–	–	–	
N	Flares, aerial	1.3G	UN 0093	Explosive (1.3G)	–	–	–	
	Flares, aerial	1.4G	UN 0403	Explosive (1.4G)	–	1,3	1,3	
	Flares, aerial	1.4S	UN 0404	None. Package to be marked '1.4S'	–	1,3	1,3	
N	Flares, surface *(other than water-activated flares)*	1.1G	UN 0418	Explosive (1.1G)	–	–	–	
N	Flares, surface *(other than water-activated flares)*	1.2G	UN 0419	Explosive (1.2G)	–	–	–	
N	Flares, surface *(other than water-activated flares)*	1.3G	UN 0092	Explosive (1.3G)	–	–	–	
	Flax, dry. See Fibres, *vegetable, dry*							
	Fluoboric acid	8	UN 1775	Corrosive	II	1,2	1,2	
	Fluoric acid. *See* Hydrofluoric acid, solution							
	Fluorine, *compressed*	2.3	UN 1045	Poison Gas, Oxidizer	–	1	5	Stow 'away from' foodstuffs, organic materials, and living quarters
	Fluoroacetic acid	6.1	UN 2642	Poison	I	1,3	1,3	Keep cool. Stow 'away from' living quarters
	4-Fluoroaniline	6.1	UN 2944	St. Andrews Cross	III	1,2	1,2	
	2-Fluoroaniline	6.1	UN 2941	St. Andrews Cross, Flammable Liquid	III	1,2	1,2	Shade from radiant heat. Segregation same as for flammable liquids
	Fluorobenzene	3.2	UN 2387	Flammable Liquid	II	1,2	1	
	Fluorophosphoric acid, *anhydrous*	8	UN 1776	Corrosive	II	1,2	1,2	
	Fluorosulphonic acid	8	UN 1777	Corrosive	I	1	5	Keep dry. Stow 'away from' fluorides
	Fluorotoluenes	3.2 3.3	UN 2388 UN 2388	Flammable Liquid Flammable Liquid	II II	1,2 1,2	1 1,2	
	Fluosilicic acid	8	UN 1778	Corrosive	II	1,2	1,2	
	Formaldehyde solutions	3.3	UN 1198	Flammable Liquid	II	1,2	1,2	
	Formaldehyde, solutions *with a flashpoint above 61 degrees C*	9	UN 2209	None	III	1,2	1,2	Stow 'away from' foodstuffs

	Formalin. *See* Formaldehyde							
	Formic acid	8	UN 1779	Corrosive	II	1,2	1,2	Glass carboy in hampers prohibited under deck
N	Fracturing devices, explosive, *for oil wells*	1.1D	UN 0099	Explosive (1.1D)	–	–	–	
	Fuel, aviation, *turbine engine*	3.2	UN 1863	Flammable Liquid	II	1,2	1	
	Fuel, pyrophoric, n.o.s.	4.2	UN 1375	Spontaneously Combustible	I	1	5	Prohibited on any ship carrying explosives (except explosives in Division 1.4, Compatibility Group S)
	Fumaryl chloride	8	UN 1780	Corrosive	II	1	1	Keep dry. Glass carboys prohibited on passenger vessels
	Furan	3.1	UN 2389	Flammable Liquid	I	1,3	5	Keep cool
	Furfural	3.3	UN 1199	Flammable Liquid	II	1,2	1,2	
	Furfuryl alcohol	6.1	UN 2874	St. Andrews Cross	III	1,2	1,2	Stow 'separated from' oxidizing substances
	Furfurylamine	3.3	UN 2526	Flammable Liquid	II	1,2	1,2	
	Fuse, igniter, *tubular, metal clad*	1.4 G	UN 0103	Explosive (1.4G)	–	1,3	1,3	
N	Fuse, instantaneous, non-detonating	1.3G	UN 0101	Explosive (1.3G)	–	–	–	
	Fusel oil	3.2	UN 1201	Flammable Liquid	II	1,2	1	
	Fuse, safety	1.4 S	UN 0105	None. Package to be marked '1.4 S'	–	1,3	1,3	
	Fuzes, detonating	1.4S	UN 0367	None. Package to be marked '1.4S'	–	1,3	1,3	
	Fuzes, detonating	1.4 B	UN 0257	Explosive (1.4B)	–	1,3	1,3	
N	Fuzes, detonating	1.1B	UN 0106	Explosive (1.1B)	–	–	–	
N	Fuzes, detonating	1.2B	UN 0107	Explosive (1.2B)	–	–	–	
N	Fuzes, detonating, *with protective features*	1.1D	UN 0408	Explosive (1.1D)	–	–	–	
N	Fuzes, detonating, *with protective features*	1.2D	UN 0409	Explosive (1.2D)	–	–	–	
N	Fuzes, detonating, *with protective features*	1.4D	UN 0410	Explosive (1.4D)	–	–	–	
	Fuzes, igniting	1.4S	UN 0368	None. Package to be marked '1.4S'	–	1,3	1,3	
N	Fuzes, igniting	1.3G	UN 0316	Explosive (1.3G)	–	–	–	
N	Fuzes, igniting	1.4G	UN 0317	Explosive (1.4G)	–	–	–	
	Gallium, *metal*	8	UN 2803	Corrosive	III	1,2	1	Stow 'away from' sources of heat and acids
	Gas drips, *hydrocarbon*	3.2	UN 1864	Flammable Liquid	II	1,2	1	
	Gas oil	3.3	UN 1202	Flammable Liquid	II	1,2	1,2	
	Gasoline	3.1	UN 1203	Flammable Liquid	II	1,3	5	Keep cool
	Germane	2.3	UN 2192	Poison Gas, Flammable Gas	–	1	5	Stow 'away from' living quarters
	Glycerol-alpha-monochlorohydrin	6.1	UN 2689	St. Andrews Cross	III	1,2	1,2	
	Glycidaldehyde	3.3	UN 2622	Flammable Liquid, Poison	II	1,2	1,2	
N	Grenades, *hand or rifle, with bursting charge*	1.1D	UN 0284	Explosive (1.1D)	–	–	–	
N	Grenades, *hand or rifle, with bursting charge*	1.2D	UN 0285	Explosive (1.2D)	–	–	–	
N	Grenades, *hand or rifle, with bursting charge*	1.1F	UN 0292	Explosive (1.1F)	–	–	–	
N	Grenades, *hand or rifle, with bursting charge*	1.2F	UN 0293	Explosive (1.2F)	–	–	–	
	Grenades, practice, *hand or rifle*	1.4 S	UN 0110	None. Package to be marked '1.4 S'	–	1,3	1,3	

Optional Hazardous Materials Table—Continued

(1)	(2)	(3)	(4)	(5)	(6)	(7)		
						Vessel Stowage Requirements		
Notes and Symbols	Hazardous Materials Description and Proper Shipping Names	IMO Class	Identification Number	Label(s) required	Packaging Group	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
N	Grenades, practice, *hand or rifle*	1.2G	UN 0372	Explosive (1.2G)	--	--	--	
N	Grenades, practice, *hand or rifle*	1.3G	UN 0318	Explosive (1.3G)	--	--	--	
	Guanidine nitrate	5.1	UN 1467	Oxidizer	III	1,2	1,2	Stow 'separated from' nitro-compounds and chlorates
N	Guanyl nitrosamino guanylidene hydrazine, *containing, by weight, at least 30% water*	1.1A	UN 0113	Explosive (1.1A)	--	--	--	
N	Guanyl nitrosamino guanyl tetrazene, *containing, by weight, at least 30% water or mixture of alcohol and water*	1.1A	UN 0114	Explosive (1.1A)	--	--	--	
	Gutta percha solution	3.2 3.3	UN 1205 UN 1205	Flammable Liquid Flammable Liquid	II II	1,2 1,2	1 1,2	
	Hafnium *metal* powder, dry	4.2	UN 2545	Spontaneously Combustible	II	1	5	
	Hafnium *metal* powder, wetted, *with not less than 25% water (a visible excess of water must be present) mechanically produced, particle size less than 53 microns, or chemically produced, particle size less than 840 microns*	4.1	UN 1326	Flammable Solid	II	1,2	5	
	Halogenated irritating liquids, n.o.s.	6.1	UN 1610	Poison, Flammable Liquid (only if flashpoint between 23 and 61 deg C)	I/II	1	5	Stow 'away from' living quarters. If flashpoint below 61 deg C, segregation same as for flammable liquids
		6.1	UN 1610	St. Andrews Cross, Flammable Liquid (only if flashpoint between 23 and 61 deg C)	III	1	5	Stow 'away from' living quarters. If flashpoint below 61 deg C, segregation same as for flammable liquids
	Hay	4.1	UN 1327	None	III	1,2	1,2	Stow 'away from' animal or vegetable oils
	Helium, *compressed*	2.2	UN 1046	Nonflammable Gas	--	1,2	1,2	
	Helium, refrigerated liquid	2.2	UN 1963	Nonflammable Gas	--	1,2	1	
	Hemp, dry. See Fibres, *vegetable, dry*							
	Heptane, *and its isomers*	3.2	UN 1206	Flammable Liquid	II	1,2	1	
	n-Heptene	3.2	UN 2278	Flammable Liquid	II	1,2	1	
	Hexachloroacetone	6.1	UN 2661	Poison	II	1,3	1	Keep cool
	Hexachlorobenzene	6.1	UN 2729	St. Andrews Cross	III	1,2	1,2	
	Hexachlorobutadiene	6.1	UN 2279	St. Andrews Cross	III	1,2	1,2	Stow 'away from' living quarters
	Hexachlorocyclopentadiene	6.1	UN 2646	Poison	I	1	5	Stow 'away from' living quarters

	Hexachlorophene	6.1	UN 2875	St. Andrews Cross	III	1,2	1,2	
	Hexadecyl trichlorosilane	8	UN 1781	Corrosive	II	1	1	Keep dry
	Hexadiene	3.1	UN 2458	Flammable Liquid	II	1,3	5	Keep cool
	Hexaethyl tetraphosphate	6.1	UN 1611	Poison	I/II	1,2	5	Stow 'away from' living quarters
		6.1	UN 1611	St. Andrews Cross	III	1,2	5	Stow 'away from' living quarters
	Hexaethyl tetraphosphate and compressed gas *mixture*	2.3	UN 1612	Poison Gas	--	1	5	Stow 'away from' living quarters
	Hexafluoroacetone	2.3	UN 2420	Poison Gas	--	1	5	Stow 'away from' living quarters
	Hexafluoroacetone hydrate	6.1	UN 2552	Poison	II	1,2	1	Stow 'away from' living quarters
	Hexafluoroethane	2.2	UN 2193	Nonflammable Gas	--	1,2	1,2	
	Hexafluorophosphoric acid	8	UN 1782	Corrosive	II	1,2	1,2	
	Hexafluoropropylene	2.2	UN 1858	Nonflammable Gas	--	1,2	1,2	
	Hexaldehyde	3.3	UN 1207	Flammable Liquid	III	1,2	1,2	
	Hexamethylenediamine, solid	8	UN 2280	Corrosive	III	1,3	1,3	Keep cool
	Hexamethylenediamine, solution	8	UN 1783	Corrosive, Poison	II	1,2	1,2	
	Hexamethylenediisocyanate	6.1	UN 2281	Poison	II	1,2	1	Keep dry
	Hexamethyleneimine	3.2	UN 2493	Flammable Liquid, Corrosive	II	1,2	1	
	3,3,6,6,9,9-Hexamethyl-1,2,4,5-tetraoxocyclononane, *maximum concentration 52% with inert solid*	5.2	UN 2166	Organic Peroxide	II	1	5	
	3,3,6,6,9,9-Hexamethyl-1,2,4,5-tetraoxocyclononane, *maximum concentration 52% in solution*	5.2	UN 2167	Organic Peroxide	II	1	5	
	3,3,6,6,9,9-Hexamethyl-1,2,4,5-tetraoxocyclononane, *technical pure*	5.2	UN 2165	Organic Peroxide	I	1	5	
	Hexamine	4.1	UN 1328	Flammable Solid	III	1,2	1,2	
	Hexane, *and its isomers*	3.1	UN 1208	Flammable Liquid	II	1,3	5	Keep cool
N	Hexanitrodiphenylamine	1.1D	UN 0079	Explosive (1.1D), Poison	--	--	--	
N	Hexanitrostilbene	1.1D	UN 0392	Explosive (1.1D)	--	--	--	
	Hexanols	3.3	UN 2282	Flammable Liquid	III	1,2	1,2	
N	Hexatonal, cast	1.1D	UN 0393	Explosive (1.1D)	--	--	--	
	Hex-1-ene	3.1	UN 2370	Flammable Liquid	II	1,3	5	Keep cool
	1-Hexene. *See* Hex-1-ene							
N	Hexolite, *dry or wetted with less than 15% water, by weight*	1.1D	UN 0118	Explosive (1.1D)	--	--	--	
	Hexyl trichlorosilane	8	UN 1784	Corrosive	II	1	1	Keep dry
	Hydrazine, anhydrous *or* Hydrazine aqueous solutions *containing more than 64%, by weight, hydrazine*	3.3	UN 2029	Flammable Liquid, Poison, Corrosive	I	1	5	
	Hydrazine hydrate *or* Hydrazine aqueous solutions *with not more than 64%, by weight, hydrazine*	8	UN 2030	Corrosive, Poison	II	1,2	5	Under deck permitted only if containing not more than 36%, by weight, hydrazine. Stow 'away from' nitric acids and perchloric acids not exceeding 50% acid by weight
	Hydrides, *metal*, n.o.s.	4.3	UN 1409	Dangerous When Wet	I	1,2	5	
	Hydriodic acid, solution	8	UN 1787	Corrosive	II	1	1	Glass carboys prohibited on passenger vessels
	Hydrobromic acid, solution	8	UN 1788	Corrosive	II	1	1	Glass carboys prohibited on passenger vessels. Stow 'away from' fluorides
	Hydrocarbon gases, compressed, n.o.s. *or* Hydrocarbon gases, mixtures, compressed, n.o.s.	2.1	UN 1964	Flammable Gas	--	1,2	1	

Optional Hazardous Materials Table—Continued

(1)	(2)	(3)	(4)	(5)	(6)	(7) Vessel Stowage Requirements		
Notes and Symbols	Hazardous Materials Description and Proper Shipping Names	IMO Class	Identification Number	Label(s) required	Packaging Group	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Hydrocarbon gases, liquefied, n.o.s. *or* Hydrocarbon gases, mixtures, liquefied, n.o.s.	2.1	UN 1965	Flammable Gas	--	1,2	1	
	Hydrochloric acid, solution	8	UN 1789	Corrosive	II	1	1	Glass carboys prohibited on passenger vessels. Stow 'away from' fluorides
	Hydrocyanic acid, anhydrous, stabilized. See Hydrogen cyanide, anhydrous, stabilized							
	Hydrocyanic acid, aqueous solutions, *with not more than 20% hydrocyanic acid*	6.1	UN 1613	Poison	I	1	5	Stow 'away from' living quarters
	Hydrofluoric acid and sulphuric acid mixtures	8	UN 1786	Corrosive, Poison	I	1	5	Stow 'away from' fluorides
	Hydrofluoric acid, solution	8	UN 1790	Corrosive, Poison	I/II	1	5	Keep cool
	Hydrofluosilicic acid. *See* Fluosilicic acid							
	Hydrogen and methane mixtures, compressed	2.1	UN 2034	Flammable Gas	--	1,2	5	
	Hydrogen bromide, anhydrous	2.3	UN 1048	Poison Gas, Corrosive	--	1	5	
	Hydrogen chloride, anhydrous	2.2	UN 1050	Nonflammable Gas, Corrosive	--	1	5	Stow 'away from' foodstuffs and living quarters
	Hydrogen, *compressed*	2.1	UN 1049	Flammable Gas	--	1,2	5	Stow 'separated from' chlorine, 'away from' living quarters
	Hydrogen cyanide, anhydrous, stabilized	6.1	UN 1051	Poison, Flammable Liquid	I	1	5	Shade from radiant heat. Segregation same as for flammable liquids
	Hydrogen cyanide, anhydrous, stabilized, *absorbed in a porous inert material*	6.1	UN 1614	Poison	I	1	5	Shade from radiant heat. Stow 'away from' living quarters
	Hydrogen fluoride, anhydrous	2.3	UN 1052	Poison Gas, Corrosive	--	1	5	
	Hydrogen iodide, anhydrous	2.2	UN 2197	Nonflammable Gas, Corrosive	--	1	5	Stow 'away from' living quarters
	Hydrogen iodide, solution. *See* Hydriodic acid solution							
	Hydrogen peroxide, aqueous solutions *with not less than 8% but less than 20% hydrogen peroxide (stabilized as necessary)*	5.1	UN 2984	Oxidizer	III	1,2	1	Shade from radiant heat. Stow 'away from' powdered metals and 'separated from' permanganates
	Hydrogen peroxide, aqueous solutions *with not less than 20% but not more than 60% hydrogen peroxide (stabilized as necessary)*	5.1	UN 2014	Oxidizer, Corrosive	II	1	5	Shade from radiant heat. Stow 'away from' powdered metals and 'separated from' permanganates
	Hydrogen peroxide, stabilized, *or* Hydrogen peroxide, aqueous solutions, stabilized, *with more than 60% hydrogen peroxide*	5.1	UN 2015	Oxidizer, Corrosive	I	1	5	Shade from radiant heat. Stow 'away from' powdered metals and 'separated from' permanganates
	Hydrogen, *refrigerated liquid*	2.1	UN 1966	Flammable Gas	--	5	5	

	Hydrogen selenide, *anhydrous*	2.3	UN 2202	Poison Gas, Flammable Gas	--	1	5	Stow 'away from' living quarters
	Hydrogen sulphide	2.1	UN 1053	Flammable Gas, Poison Gas	--	1	5	Stow 'away from' foodstuffs and living quarters
	Hydroquinone	6.1	UN 2662	St. Andrews Cross	III	1,2	1,2	
	Hydrosilicofluoric acid. *See* Fluosilicic acid							
	Hydroxylamine sulphate	8	UN 2865	Corrosive	III	1,2	1,2	Keep dry
	Hypochlorite, solutions *with more than 5% available chlorine*	8	UN 1791	Corrosive	II/III	1,2	1	Glass carboys in hampers prohibited under deck
	Igniter for aircraft thrust device *for assisted take-off*	4.1	UN 2792	Flammable Solid	II	1,2	5	
	Igniters	1.4 G	UN 0325	Explosive (1.4G)	--	1,3	1,3	
N	Igniters	1.1G	UN 0121	Explosive (1.1G)	--	--	--	
N	Igniters	1.2G	UN 0314	Explosive (1.2G)	--	--	--	
N	Igniters	1.3G	UN 0315	Explosive (1.3G)	--	--	--	
	3,3'-Iminobispropylamine	8	UN 2269	Corrosive	III	1,2	1,2	
	Inflammable gas in lighters. *See* Lighters, for cigars and cigarettes, *etc. with flammable gas*							
	Inflammable liquid preparations, n.o.s. *See* Flammable liquid preparations, n.o.s.							
	Inflammable liquids, corrosive, n.o.s. *See* Flammable liquids, corrosive, n.o.s.							
	Inflammable liquids, n.o.s. *See* Flammable liquids, n.o.s.							
	Inflammable liquids, poisonous, n.o.s. *See* Flammable liquids, poisonous, n.o.s.							
	Inflammable solids, corrosive, n.o.s. *See* Flammable solids, corrosive, n.o.s.							
	Inflammable solids, n.o.s. *See* Flammable solids, n.o.s.							
	Inflammable solids, poisonous, n.o.s. *See* Flammable solids, poisonous, n.o.s.							
	Ink, printers	3.2	UN 1210	Flammable Liquid	II	1,2	1	
		3.3	UN 1210	Flammable Liquid	III	1,2	1,2	
	Insecticide gases, *non-toxic*, n.o.s.	2.1	UN 1968	Flammable Gas	--	1,2	1	
		2.2	UN 1968	Nonflammable Gas	--	1,3	1,3	
	Insecticide gases, *toxic*, n.o.s.	2.3	UN 1967	Poison Gas	--	1	5	Shade from radiant heat
	Iodine monochloride	8	UN 1792	Corrosive	II	1	5	Keep dry
	Iodine pentafluoride	5.1	UN 2495	Oxidizer, Poison	I	1	5	Keep dry
	2-Iodobutane	3.2	UN 2390	Flammable Liquid	II	1,2	1	
	Iodomethylpropanes	3.2	UN 2391	Flammable Liquid	II	1,2	1	
	Iodopropanes	3.2	UN 2392	Flammable Liquid	II	1,2	1	
		3.3	UN 2392	Flammable Liquid	II	1,2	1,2	
	Iron carbonyl. *See* Iron pentacarbonyl							
	Iron chloride. *See* Ferric chloride, anhydrous							
	Iron oxide, *spent*	4.2	UN 1376	Spontaneously Combustible	III	1,2	5	

Optional Hazardous Materials Table—Continued

(1)	(2)	(3)	(4)	(5)	(6)	(7) Vessel Stowage Requirements		
Notes and Symbols	Hazardous Materials Description and Proper Shipping Names	IMO Class	Identification Number	Label(s) required	Packaging Group	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Iron pentacarbonyl	6.1	UN 1994	Poison, Flammable Liquid	I	1	5	Segregation same as for flammable liquids. Shade from radiant heat
	Iron sesquichloride *See* Ferric chloride							
	Iron sponge, *spent* *See* Iron oxide, *spent*							
	Isobutane *or* Isobutane mixtures	2.1	UN 1969	Flammable Gas	--	1,2	1	
	Isobutanol	3.3	UN 1212	Flammable Liquid	II	1,2	1,2	
	Isobutyl acetate	3.2	UN 1213	Flammable Liquid	II	1,2	1	
	Isobutyl acrylate, *inhibited*	3.3	UN 2527	Flammable Liquid	II	1,2	1,2	
	Isobutyl alcohol *See* isobutanol							
	Isobutyl aldehyde *See* Isobutyraldehyde							
	Isobutylamine	3.2	UN 1214	Flammable Liquid	II	1,2	1	
	Isobutylene	2.1	UN 1055	Flammable Gas	--	1,2	1	
	Isobutyl formate	3.2	UN 2393	Flammable Liquid	II	1,2	1	
	Isobutyl isobutyrate	3.3	UN 2528	Flammable Liquid	III	1,2	1,2	
	Isobutyl isocyanate	3.2	UN 2486	Flammable Liquid, Poison	II	1	5	Keep cool. Stow 'away from' living quarters and sources of heat
	Isobutyl methacrylate, *inhibited*	3.3	UN 2283	Flammable Liquid	III	1,2	1,2	
	Isobutyl methyl ketone peroxide, *maximum concentration 62% in solution*	5.2	UN 2126	Organic Peroxide	I	1	5	
	Isobutyl propionate	3.2	UN 2394	Flammable Liquid	II	1,2	1	
	Isobutyraldehyde	3.1	UN 2045	Flammable Liquid	II	1,3	5	Keep cool
	Isobutyric acid	3.3	UN 2529	Flammable Liquid	III	1,2	1,2	
	Isobutyric anhydride	3.3	UN 2530	Flammable Liquid	III	1,2	1,2	
	Isobutyronitrile	3.2	UN 2284	Flammable Liquid, Poison	II	1,3	5	Keep cool
	Isobutyryl chloride	3.2	UN 2395	Flammable Liquid, Poison	II	1	1	Keep dry. Shade from radiant heat
	Isobutyryl peroxide, *maximum concentration 52% in solution*	5.2	UN 2182	Organic Peroxide	II	1	5	Control temperature -20 deg C. Emergency temperature – 10 deg C
	Isocyanates, n.o.s. *or* Isocyanate solutions, n.o.s., *boiling point not less than 300 deg C*	6.1	UN 2207	St. Andrews Cross	III	1,2	1,2	Stow 'away from' sources of heat
	Isocyanates, n.o.s. *or* Isocyanate solutions, n.o.s., *flashpoint not less than 23 deg C, boiling point less than 300 deg C*	6.1	UN 2206	Poison, Flammable Liquid (only if flashpoint is below 61 deg C.)	II	1,3	1	Shade from radiant heat. Segregation same as for flammable liquids if flashpoint below 61 deg C

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	Isocyanates, n.o.s. *or* Isocyanate solutions, n.o.s. *flashpoint not less than -18 deg C but less than 23 deg C*	3.2	UN 2478	Flammable Liquid, Poison	II	1	5	
	Isocyanates, n.o.s. *or* Isocyanate solutions, n.o.s. *flashpoint less than -18 deg C*	3.1	UN 2478	Flammable Liquid, Poison	II	1	5	Stow 'away from' sources of heat. Keep cool.
	Isocyanatobenzotrifluorides	6.1	UN 2285	Poison	II	1,2	1	Shade from radiant heat. Stow 'away from' living quarters
	Isoheptene	3.1	UN 2287	Flammable Liquid	II	1,3	5	Keep cool
	Isohexene	3.1	UN 2288	Flammable Liquid	II	1,3	5	Keep cool
	Isononanoyl peroxide. *See* Di-(3,3,5-trimethylhexanoyl) peroxide				--	--	--	
	Isooctene	3.2	UN 1216	Flammable Liquid	II	1,2	1	
	Isopentane. *See* Pentanes							
	Isopentenes	3.1	UN 2371	Flammable Liquid	I	1,3	5	Keep cool
	Isophoronediamine	8	UN 2289	Corrosive	III	1,2	1,2	Glass carboys prohibited on passenger vessels
	Isophorone diisocyanate	6.1	UN 2290	Poison	II	1,2	1	Stow 'away from' living quarters
	Isoprene, inhibited	3.1	UN 1218	Flammable Liquid	I	1,3	5	Keep cool
	Isopropanol	3.2	UN 1219	Flammable Liquid	II	1,2	1	
	Isopropenyl acetate	3.2	UN 2403	Flammable Liquid	II	1,2	1	
	Isopropenylbenzene	3.3	UN 2303	Flammable Liquid	II	1,2	1,2	
	Isopropyl acetate	3.2	UN 1220	Flammable Liquid	II	1,2	1	
	Isopropyl acid phosphatic	8	UN 1793	Corrosive	III	1,2	1,2	Glass carboys in hampers prohibited under deck
	Isopropyl alcohol. *See* Isopropanol							
	Isopropylamine	3.1	UN 1221	Flammable Liquid	I	1,3	5	Keep cool
	Isopropylbenzene	3.3	UN 1918	Flammable Liquid	II	1,2	1,2	
	Isopropyl butyrate	3.3	UN 2405	Flammable Liquid	II	1,2	1,2	
	Isopropyl chloroacetate	3.3	UN 2947	Flammable Liquid	III	1,2	1,2	
	Isopropyl chloroformate	3.2	UN 2407	Flammable Liquid, Corrosive	II	1,2	1	
	Isopropyl-2-chloropropionate	3.3	UN 2934	Flammable Liquid	III	1,2	1,2	
	Isopropyl isobutyrate	3.2	UN 2406	Flammable Liquid	II	1,2	1	
	Isopropyl isocyanate	3.2	UN 2483	Flammable Liquid, Poison	I	1	5	Keep cool
	Isopropyl nitrate	3.2	UN 1222	Flammable Liquid	II	1,2	1	
	Isopropyl propionate	3.2	UN 2409	Flammable Liquid	II	1,2	1	
	Isosorbide dinitrate mixture *with not less than 60% lactose, mannose, starch, or calcium hydrogen phosphate*	4.1	UN 2907	Flammable Solid	II	1,2	5	
N	Jet perforating guns, charged, *oil well, without detonator*	1.1D	UN 0124	Explosive (1.1D)	--	--	--	
	Jute, dry. See Fibres, *vegetable, dry*							
	Kapok, dry. See Fibres, *vegetable, dry*							
	Kerosene	3.3	UN 1223	Flammable Liquid	II	1,2	1,2	
	Ketones, liquid, n.o.s.	3.1 3.2 3.3	UN 1224 UN 1224 UN 1224	Flammable Liquid Flammable Liquid Flammable Liquid	I/II II II	1,3 1,2 1,2	5 1 1,2	Keep cool
	Krypton, *compressed*	2.2	UN 1036	Nonflammable Gas	--	1,2	1,2	

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Optional Hazardous Materials Table—Continued

(1) Notes and Symbols	(2) Hazardous Materials Description and Proper Shipping Names	(3) IMO Class	(4) Identification Number	(5) Label(s) required	(6) Packaging Group	(7) Vessel Stowage Requirements (a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Krypton, refrigerated liquid	2.2	UN 1970	Nonflammable Gas	–	1,2	1	
	Lacquer base. *See* Paints, *etc.*							
	Lacquer chips. *See* Nitrocellulose, *wetted with, by weight, more than 40% flammable liquids*							
	Lacquers. *See* Paints, *etc.*							
	Lauroyl peroxide. *See* Dilauroyl peroxide				–	–	–	
	Lead acetate	6.1	UN 1616	St. Andrews Cross	III	1,2	1,2	
	Lead arsenates	6.1	UN 1617	Poison	II	1,2	1,2	
	Lead arsenites	6.1	UN 1618	Poison	II	1,2	1,2	
N	Lead azide, *containing, by weight, at least 20% water or mixture of alcohol and water*	1.1A	UN 0129	Explosive (1.1A)	–	–	–	
	Lead compounds, soluble, n.o.s.	6.1	UN 2291	St. Andrews Cross	III	1,2	1,2	
	Lead cyanide	6.1	UN 1620	Poison	II	1,2	1,2	Stow 'away from' acids
	Lead dioxide	5.1	UN 1872	Oxidizer	III	1,2	1,2	Stow 'away from' foodstuffs
	Lead dross. *See* Lead sulphate, *with more than 3% free acid*							
	Lead nitrate	5.1	UN 1469	Oxidizer, Poison	II	1,2	1,2	
	Lead perchlorate	5.1	UN 1470	Oxidizer, Poison	II	1,2	1,2	Stow 'away from' powdered metals
	Lead peroxide. *See* Lead dioxide							
	Lead phosphite dibasic	4.1	UN 2989	Flammable Solid	II	1,2	1	Stow 'away from' foodstuffs
N	Lead styphnate, *containing, by weight, at least 20% water or mixture of alcohol and water*	1.1A	UN 0130	Explosive (1.1A)	–	–	–	
	Lead sulphate, *with more than 3% free acid*	8	UN 1794	Corrosive	II	1,2	1,2	
	Life-rafts, *inflatable*	9	–	None	–	1,2	1,2	
	Lighter fuels, *cigar and cigarette*	3.2	UN 1226	Flammable Liquid	II	1,2	1	
	Lighters for cigars and cigarettes, etc., *with flammable gas*	2.1	UN 1057	Flammable Gas	–	1	1	
	Lighters *for cigars and cigarettes, etc., with* fuel	3.2	UN 1226	Flammable Liquid	II	1,2	1	
	Lighters, fuse	1.4 S	UN 0131	None. Package to be marked '1.4 S'	–	1,3	1,3	
	Liquefied gases, n.o.s. See Compressed or Liquefied gases, n.o.s.							
	Liquefied non-flammable gases *charged with* nitrogen, carbon dioxide *or* air	2.2	UN 1058	Nonflammable Gas	–	1,2	1,2	
	Lithium alkyls	4.2	UN 2445	Spontaneously Combustible	I	1	1	
	Lithium aluminium hydride	4.3	UN 1410	Dangerous When Wet	I	1,2	5	

Lithium aluminum hydride, *ethereal*	4.3	UN 1411	Dangerous When Wet, Flammable Liquid	I	1	5	
Lithium amide	4.3	UN 1412	Dangerous When Wet	II	1,2	5	
Lithium borohydride	4.3	UN 1413	Dangerous When Wet	I	1,2	5	
Lithium ferrosilicon	4.3	UN 2830	Dangerous When Wet	II	1,2	5	
Lithium hydride	4.3	UN 1414	Dangerous When Wet	I	1,2	5	
Lithium hydride, fused solid	4.3	UN 2805	Dangerous When Wet	II	1,2	5	
Lithium hydroxide monohydrate	8	UN 2680	Corrosive	II	1,2	1,2	Keep dry
Lithium hydroxide, solution	8	UN 2679	Corrosive	II	1,2	1,2	Glass carboys not permitted under deck on passenger vessels
Lithium hypochlorite, dry *or* Lithium hypochlorite mixtures *containing more than 39% available chlorine (8.8% available oxygen)*	5.1	UN 1471	Oxidizer	II	1,2	1,2	
Lithium, *metal*	4.3	UN 1415	Dangerous When Wet	II	1,2	5	
Lithium nitrate	5.1	UN 2722	Oxidizer	III	1,2	1,2	
Lithium nitride	4.3	UN 2806	Dangerous When Wet	I	1,2	5	
Lithium peroxide	5.1	UN 1472	Oxidizer	II	1,2	1,2	Keep dry
Lithium silicon	4.3	UN 1417	Dangerous When Wet	II	1,2	1,2	
London purple	6.1	UN 1621	Poison	II	1,2	1,2	
Lye. *See* Sodium hydroxide							
Magnesium aluminum phosphide	4.3	UN 1419	Dangerous When Wet	I	1,2	5	When stowed under deck, stow in a mechanically ventilated space
Magnesium arsenate	6.1	UN 1622	Poison	II	1,2	1,2	
Magnesium bromate	5.1	UN 1473	Oxidizer	II	1,2	1,2	Stow 'away from' powdered metals, 'separated from' ammonium compounds
Magnesium chlorate	5.1	UN 2723	Oxidizer	II	1,2	1,2	Stow 'separated from' ammonium compounds and 'away from' finely powdered metals
Magnesium diamide	4.2	UN 2004	Spontaneously Combustible	II	1	1	
Magnesium diphenyl	4.2	UN 2005	Spontaneously Combustible	I	1	1	
Magnesium granules, coated *containing more than 50% magnesium, particle size not less than 149 microns*	4.3	UN 2950	Dangerous When Wet	III	1,2	1,2	
Magnesium hydride	4.3	UN 2010	Dangerous When Wet	I	1,2	5	
Magnesium nitrate	5.1	UN 1474	Oxidizer	III	1,2	1,2	
Magnesium *or* Magnesium alloys *with more than 50% magnesium, in pellets, turnings or ribbon*	4.1	UN 1869	Flammable Solid	III	1,2	1,2	Stow 'away from' liquid halogenated hydrocarbons
Magnesium perchlorate	5.1	UN 1475	Oxidizer	II	1,2	1,2	Stow 'away from' powdered metals
Magnesium peroxide	5.1	UN 1476	Oxidizer	II	1,2	1,2	Keep dry
Magnesium phosphide	4.3	UN 2011	Dangerous When Wet, Poison	I	1,2	5	When stowed under deck, stow in a mechanically ventilated space
Magnesium powder *or* Magnesium alloys, powder *containing more than 50% magnesium, non-pyrophoric*	4.3	UN 1418	Dangerous When Wet	II	1,2	1,2	Stow 'away from' liquid halogenated hydrocarbons
Magnesium silicide	4.3	UN 2624	Dangerous When Wet	II	1,2	1	
Magnesium silicofluoride	6.1	UN 2853	St. Andrews Cross	III	1,2	1,2	Stow 'away from' acids
Maleic anhydride, *solid or molten*	8	UN 2215	None. Package to be marked 'Class 8'	III	1,2	1,2	Stow 'away from' foodstuffs

Optional Hazardous Materials Table—Continued

(1)	(2)	(3)	(4)	(5)	(6)	(7) Vessel Stowage Requirements		
Notes and Symbols	Hazardous Materials Description and Proper Shipping Names	IMO Class	Identification Number	Label(s) required	Packaging Group	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Malononitrile	6.1	UN 2647	Poison	II	1,3	1,3	Keep cool. Stow 'away from' living quarters
	Maneb, *or* Maneb preparation(s), *stabilized against self-heating*	4.3	UN 2968	Dangerous When Wet	III	1,2	1,2	Stow 'away from' acids, living quarters and foodstuffs
	Maneb, *or* maneb preparation(s) with *not less than 60% maneb*	4.2	UN 2210	Spontaneously Combustible, Dangerous When Wet	III	1,2	1,2	Stow 'away from' acids, living quarters and foodstuffs. Keep cool and dry
	Manganese ethylene-bis-dithiocarbamate. See Maneb							
	Manganese nitrate	5.1	UN 2724	Oxidizer	III	1,2	1,2	
	Manganese resinate	4.1	UN 1330	Flammable Solid	III	1,2	1,2	
N	Mannitol hexanitrate, *containing, by weight, at least 40% water or mixture of alcohol and water*	1.1D	UN 0133	Explosive (1.1D)	–	–	–	
	Matches, *fusee*	4.1	UN 2254	Flammable Solid	III	1,2	1,2	
	Matches, safety	4.1	UN 1944	Flammable Solid	III	1,2	1,2	
	Matches, *strike anywhere*	4.1	UN 1331	Flammable Solid	III	1,2	1	
	Matches, wax 'vesta'	4.1	UN 1945	Flammable Solid	III	1,2	1	
N	Medicines, n.o.s. *to be classified and labeled according to the principle hazardous constituent*	–	UN 1851		–			
	MEKP. See Ethyl methyl ketone peroxide							
	p-Menthane hydroperoxide, *technical pure*	5.2	UN 2125	Organic Peroxide	I	1	5	
	Mercaptans, liquid, n.o.s. *or* Mercaptan mixtures, liquid, n.o.s.	3.1 3.2 3.3	UN 1228 UN 1228 UN 1228	Flammable Liquid Flammable Liquid Flammable Liquid	II II II	1,3 1,2 1,2	5 1 1,2	Keep cool
	Mercuric acetate. *See* Mercury acetate							
	Mercuric arsenate	6.1	UN 1623	Poison	II	1,2	1,2	
	Mercuric bromide. *See* Mercury bromides							
	Mercuric chloride	6.1	UN 1624	Poison	II	1,2	1,2	
	Mercuric cyanide. *See* Mercury cyanide							
	Mercuric nitrate	6.1	UN 1625	Poison	II	1,2	1,2	
	Mercuric oxycyanide. *See* Mercury oxycyanide							
	Mercuric potassium cyanide	6.1	UN 1626	Poison	I	1,2	1,2	Stow 'away from' acids
	Mercuric sulphate	6.1	UN 1645	Poison	II	1,2	1,2	
	Mercurol. *See* Mercury nucleate							

	Mercurous acetate. *See* Mercury acetate							
	Mercurous bromide. *See* Mercury bromides							
	Mercurous nitrate	6.1	UN 1627	Poison	II	1,2	1,2	
	Mercurous sulphate	6.1	UN 1628	Poison	II	1,2	1,2	
	Mercury acetate	6.1	UN 1629	Poison	II	1,2	1,2	
	Mercury ammonium chloride	6.1	UN 1630	Poison	II	1,2	1,2	
	Mercury based pesticides, liquid, flammable, toxic, n.o.s., *flashpoint below 23 deg C*	3.2	UN 2778	Flammable Liquid and Poison or St. Andrews Cross (according to toxicity)	I/II	1,2	1	
	Mercury based pesticides, liquid, toxic, flammable, n.o.s., *flashpoint between 23 deg C and 61 deg C*	6.1	UN 3011	Poison, Flammable Liquid	I	1	1	Segregation same as for flammable liquids
		6.1	UN 3011	Poison, Flammable Liquid	II	1,2	1	Segregation same as for flammable liquids
		6.1	UN 3011	St. Andrews Cross, Flammable Liquid	III	1,2	1,2	Segregation same as for flammable liquids
	Mercury based pesticides, liquid, toxic, n.o.s.	6.1	UN 3012	Poison	I	1	1	
		6.1	UN 3012	Poison	II	1,2	1	
		6.1	UN 3012	St. Andrews Cross	III	1,2	1,2	
	Mercury based pesticides, solid, toxic, n.o.s.	6.1	UN 2777	Poison	I/II	1,2	1,2	
		6.1	UN 2777	St. Andrews Cross	III	1,2	1,2	
	Mercury benzoate	6.1	UN 1631	Poison	II	1,2	1,2	
	Mercury bisulphate	6.1	UN 1633	Poison	II	1,2	1,2	
	Mercury bromides	6.1	UN 1634	Poison	II	1,2	1,2	
	Mercury compounds, liquid, n.o.s.	6.1	UN 2024	Poison	I/II	1,2	1	
		6.1	UN 2024	St. Andrews Cross	III	1,2	1	
	Mercury compounds, solid, n.o.s.	6.1	UN 2025	Poison	I/II	1,2	1,2	
		6.1	UN 2025	St. Andrews Cross	III	1,2	1,2	
	Mercury cyanide	6.1	UN 1636	Poison	II	1,2	1,2	Stow 'away from' living quarters and acids
N	Mercury fulminate, *containing, by weight, at least 20% water or mixture of alcohol and water*	1.1A	UN 0135	Explosive (1.1A)	–	–	–	
	Mercury gluconate	6.1	UN 1637	Poison	II	1,2	1,2	
	Mercury iodide	6.1	UN 1638	Poison	II	1,2	1,2	
	Mercury, *metal*	8	UN 2809	Corrosive	III	1,2	1	Stow 'away from' living quarters and acids
	Mercury nucleate	6.1	UN 1639	Poison	II	1,2	1,2	
	Mercury oleate	6.1	UN 1640	Poison	II	1,2	1,2	
	Mercury oxide	6.1	UN 1641	Poison	II	1,2	1,2	
	Mercury oxycyanide	6.1	UN 1642	Poison	II	1,2	1,2	Stow 'away from' acids
	Mercury potassium iodide	6.1	UN 1643	Poison	II	1,2	1,2	
	Mercury salicylate	6.1	UN 1644	Poison	II	1,2	1,2	
	Mercury thiocyanate	6.1	UN 1646	Poison	II	1,2	1,2	
	Mesityl oxide	3.3	UN 1229	Flammable Liquid	II	1,2	1,2	

Optional Hazardous Materials Table—Continued

(1)	(2)	(3)	(4)	(5)	(6)	(7) Vessel Stowage Requirements		
Notes and Symbols	Hazardous Materials Description and Proper Shipping Names	IMO Class	Identification Number	Label(s) required	Packaging Group	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Metal alkyls, n.o.s.	4.2	UN 2003	Spontaneously Combustible	I	1	5	
	Metaldehyde	4.1	UN 1332	Flammable Solid	III	1,2	1,2	
	Methacrylaldehyde	3.2	UN 2396	Flammable Liquid, Poison	II	1,3	5	Keep cool
	Methacrylic acid, *inhibited*	8	UN 2531	Corrosive	III	1	1	Keep cool. Glass carboys prohibited on passenger vessels
	Methallyl alcohol	3.3	UN 2614	Flammable Liquid	II	1,2	1,2	
	Methane *or* Natural gases *with a high methane content, compressed*	2.1	UN 1971	Flammable Gas	–	1,2	5	Stow 'away from' living quarters
	Methane *or* Natural gases *with a high methane content, refrigerated liquid*	2.1	UN 1972	Flammable Gas	–	1	5	Stow 'away from' living quarters
	Methanol	3.2	UN 1230	Flammable Liquid, Poison	II	1,2	1	
	Methoxymethyl isocyanate	3.2	UN 2605	Flammable Liquid, Poison	I	1	5	Keep cool. Stow 'away from' living quarters and sources of heat
	4-Methoxy-4-methylpentan-2-one	3.3	UN 2293	Flammable Liquid	III	1,2	1,2	
	Methyl acetate	3.2	UN 1231	Flammable Liquid	II	1,2	1	
	Methyl acetone	3.2	UN 1232	Flammable Liquid	II	1,2	1	
	Methyl acetylene and propadiene *mixture, stabilized*	2.1	UN 1060	Flammable Gas	–	1,2	1	Stow 'away from' living quarters
	beta-Methyl acrolein. *See* Crotonaldehyde, *inhibited*							
	Methyl acrylate, *inhibited*	3.2	UN 1919	Flammable Liquid	II	1,2	1	
	Methylal	3.1	UN 1234	Flammable Liquid	II	1,3	5	Keep cool
	Methyl alcohol. *See* Methanol							
	Methyl allyl chloride	3.1	UN 2554	Flammable Liquid	II	1,3	5	Keep cool
	Methyl aluminum sesquibromide	4.2	UN 1926	Spontaneously Combustible	I	1	1	
	Methyl aluminum sesquichloride	4.2	UN 1927	Spontaneously Combustible	I	1	1	
	Methylamine, *anhydrous*	2.1	UN 1061	Flammable Gas	–	1,2	5	Stow 'away from' living quarters
	Methylamine, *aqueous solution*	3.1	UN 1235	Flammable Liquid	II	1,3	5	Keep cool. Stow 'away from' mercury and its compounds
	Methylamyl acetate	3.3	UN 1233	Flammable Liquid	III	1,2	1,2	
	Methyl amyl ketone. *See* Amyl methyl ketone							
	N-Methylaniline	6.1	UN 2294	St. Andrews Cross	III	1,2	1,2	

Methylbenzoate	6.1	UN 2938	St. Andrews Cross	III	1,2	1,2	
alpha-Methylbenzyl alcohol	6.1	UN 2937	St. Andrews Cross	III	1,2	1,2	
Methyl bromide	2.3	UN 1062	Poison Gas	–	1,2	5	Under deck stowage permitted only if an indicating substance such as chloropicrin has been added
Methyl bromide and chloropicrin, mixtures. *See* Chloropicrin and methyl bromide, mixtures							
Methyl bromide and ethylene dibromide mixtures, liquid	6.1	UN 1647	Poison	I	1	1	Stow 'away from' living quarters
Methyl bromoacetate	6.1	UN 1643	Poison	II	1	5	Keep cool. Stow 'away from' living quarters
2-Methyl-1,3-butadiene. *See* Isoprene							
3-Methyl butan-2-one	3.2	UN 2397	Flammable Liquid	II	1,2	1	
3-Methyl-1-butene	3.2	UN 2561	Flammable Liquid	II	1,2	1	
2-Methyl-1-butene	3.1	UN 2459	Flammable Liquid	I	1,3	5	Keep cool
2-Methyl-2-butene	3.1	UN 2460	Flammable Liquid	II	1,3	5	Keep cool
N-Methylbutylamine	3.2	UN 2945	Flammable Liquid	II	1,2	1	
Methyl-tert-butyl ether	3.2	UN 2398	Flammable Liquid	II	1,2	1	
Methyl butyrate	3.2	UN 1237	Flammable Liquid	II	1,2	1	
Methyl chloride	2.3	UN 1063	Poison Gas, Flammable Gas	–	1,2	5	
Methyl chloride and chloropicrin, mixtures. See Chloropicrin and methyl chloride, mixtures							
Methyl chloride and methylene chloride, mixtures	2.1	UN 1912	Flammable Gas	–	1,2	5	
Methyl chloroacetate	3.3	UN 2295	Flammable Liquid	II	1,2	1,2	
Methyl chlorocarbonate. *See* Methyl chloroformate							
Methyl chloroformate	3.2	UN 1238	Flammable Liquid, Poison, Corrosive	I	1,2	1	
Methylchloromethyl ether	3.1	UN 1239	Flammable Liquid	II	1	5	Keep cool
Methyl-2-chloropropionate	3.3	UN 2933	Flammable Liquid	III	1,2	1,2	
Methyl chlorosilane	3.2	UN 2534	Flammable Liquid, Corrosive	I	1,2	1	
Methyl cyanide	3.2	UN 1648	Flammable Liquid, Poison	II	1,2	1	
Methyl cyclohexane	3.2	UN 2296	Flammable Liquid	II	1,2	1	
Methyl cyclohexanol	3.3	UN 2617	Flammable Liquid	III	1,2	1,2	
Methyl cyclohexanone	3.3	UN 2297	Flammable Liquid	III	1,2	1,2	
Methyl cyclopentane	3.1	UN 2298	Flammable Liquid	II	1,2	1	
Methyl dichloroacetate	6.1	UN 2299	St. Andrews Cross	III	1,2	1,2	Stow 'away from' living quarters
Methyldichlorosilane	3.2	UN 1242	Flammable Liquid, Corrosive	I	1,2	1	
Methylene chloride. *See* Dichloromethane							
Methylene di (phenylene isocyanate). See Diphenylmethane diisocyanate							
Methyl ethyl ether. *See* Ethyl methyl ether							
Methyl ethyl ketone peroxide(s). *See* Ethyl methyl ketone peroxide							
Methyl ethyl ketone. *See* Ethyl methyl ketone							
2-Methyl-5-ethylpyridine	6.1	UN 2300	St. Andrews Cross	III	1,2	1,2	Stow 'away from' living quarters

Optional Hazardous Materials Table—Continued

(1) Notes and Symbols	(2) Hazardous Materials Description and Proper Shipping Names	(3) IMO Class	(4) Identification Number	(5) Label(s) required	(6) Packaging Group	(7) Vessel Stowage Requirements (a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Methyl fluoride	2.1	UN 2454	Flammable Gas	–	1,2	5	
	Methyl formate	3.1	UN 1243	Flammable Liquid	I	1,3	5	Keep cool
	2-Methylfuran	3.1	UN 2301	Flammable Liquid	II	1,3	5	Keep cool
	5-Methylhexan-2-one	3 3	UN 2302	Flammable Liquid	III	1,2	1,2	
	Methylhydrazine	3.2	UN 1244	Flammable Liquid, Corrosive	I	1,2	1	
	Methyl iodide	6.1	UN 2644	Poison	II	1,3	1,3	Keep cool. Stow 'away from' living quarters
	Methyl isobutyl carbinol	3.3	UN 2053	Flammable Liquid	III	1,2	1,2	
	Methyl isobutyl ketone	3.2	UN 1245	Flammable Liquid	II	1,2	1	
	Methyl isocyanate *or* Methyl isocyanate solutions	3.2	UN 2480	Flammable Liquid, Poison	I	1	5	Keep cool. Stow 'away from' living quarters and sources of heat
	Methyl isopropenyl ketone, *inhibited*	3.2	UN 1246	Flammable Liquid	II	1,2	1	
	Methyl isothiocyanate	3.2	UN 2477	Flammable Liquid, Poison	II	1	5	Keep cool. Stow 'away from' living quarters and sources of heat
	Methylisovalerate	3.2	UN 2400	Flammable Liquid	II	1,2	1	
	Methyl magnesium bromide, in ethyl ether	4.2	UN 1928	Spontaneously Combustible	I	1	5	
	Methylmercaptan	2.1	UN 1064	Flammable Gas	–	1,2	1	
	Methyl methacrylate, *monomer, inhibited*	3.2	UN 1247	Flammable Liquid	II	1,2	1	
	Methylmorpholine	3.2	UN 2535	Flammable Liquid, Corrosive	II	1,2	1	
		3.3	UN 2535	Flammable Liquid, Corrosive	II	1,2	1,2	
	Methyl nitrite - Carriage Forbidden							
	Methyl orthosilicate	3.2	UN 2606	Flammable Liquid, Poison	I	1,3	5	Keep cool
	Methylpentadiene	3.1	UN 2461	Flammable Liquid	II	1,3	5	Keep cool
	Methylpentanes	3.1	UN 2462	Flammable Liquid	II	1,3	5	Keep cool
	2-Methylpentan-2-ol	3.3	UN 2560	Flammable Liquid	II	1,2	1,2	
	Methylphenyldichlorosilane	3.3	UN 2437	Flammable Liquid, Corrosive	II	1	1	
	1-Methylpiperidine	3.2	UN 2399	Flammable Liquid	II	1,2	1	
	Methyl propionate	3.2	UN 1248	Flammable Liquid	II	1,2	1	
	Methyl propyl ether	3.1	UN 2612	Flammable Liquid	II	1,3	5	Keep cool

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	Methyl propyl ketone	3.2	UN 1249	Flammable Liquid	II	1,2	1	
	Methyl sulphide. *See* Dimethyl sulfide							
	Methyltetrahydrofuran	3.2	UN 2536	Flammable Liquid	II	1,2	1	
	Methyl trichloroacetate	6.1	UN 2533	St. Andrews Cross	III	1,2	1,2	
	Methyltrichlorosilane	3.2	UN 1250	Flammable Liquid, Corrosive	II	1,2	1	
	alpha-Methyl valeraldehyde	3.3	UN 2367	Flammable Liquid	III	1,2	1,2	
	Methyl vinyl ketone	3.2	UN 1251	Flammable Liquid	II	1,2	1	
N	Mines, *with bursting charge*	1.1D	UN 0137	Explosive (1.1D)	--	--	--	
N	Mines, *with bursting charge*	1.2D	UN 0138	Explosive (1.2D)	--	--	--	
N	Mines, *with bursting charge*	1.1F	UN 0136	Explosive (1.1F)	--	--	--	
N	Mines, *with bursting charge*	1.2F	UN 0294	Explosive (1.2F)	--	--	--	
	Mixed acid, spent. See Acid mixtures, spent, nitrating							
	Molybdenum pentachloride	8	UN 2508	Corrosive	III	1	1	Keep dry. Glass carboys prohibited on passenger vessels
	Monochlorodifluoromethane. *See* Chlorodifluoromethane							
	Monochloropentafluoroethane. *See* Chloropentafluoroethane							
	Monochlorotetrafluoroethane. *See* Chlorotetrafluoroethane							
	Monochlorotrifluoromethane. *See* Chlorotrifluoromethane							
	Monoethanolamine. *See* Ethanolamine *and solutions thereof.*							
	Monoethylamine. *See* Ethylamine							
	Monomethylamine, *anhydrous. See* Methylamine, *anhydrous*							
	Monomethylamine, *aqueous solution. See* Methylamine, aqueous solution							
	Mononitrotoluidines	6.1	UN 2660	St. Andrews Cross	III	1,2	1,2	
	Monopropylamine	3.1	UN 1277	Flammable Liquid	II	1,2	5	
	Morpholine	3.3	UN 2054	Flammable Liquid	II	1,2	1,2	
	Motor fuel anti-knock mixtures	6.1	UN 1649	Poison, Flammable Liquid (only if flashpoint below 61 deg C)	I	1	5	If flashpoint below 61 deg C segregation same as for flammable liquids. Stow 'away from' living quarters
	Motor fuel, n.o.s.	3.1	(UN 1203)	Flammable Liquid	II	1,3	5	Keep cool
	Motor spirit. *See* Gasoline							
	Muriatic acid. *See* Hydrochloric acid							
	Naphthalene, crude *or* refined	4.1	UN 1334	Flammable Solid	III	1,2	1,2	
	Naphtha, petroleum	3.2	UN 1255	Flammable Liquid	II	1,2	1	
	Naphtha, solvent	3.2	UN 1256	Flammable Liquid	II	1,2	1	
	Naphthylamine *(alpha)*	6.1	UN 2077	St. Andrews Cross	III	1,2	1,2	
	Naphthylamine *(beta)*	6.1	UN 1650	Poison	II	1,2	1,2	
	alpha-Naphthylthiourea	6.1	UN 1651	Poison	II	1,2	1,2	
	Naphthylurea	6.1	UN 1652	Poison	II	1,2	1,2	
	Napthalene, molten	4.1	UN 2304	Flammable Solid	III	1	1	
	Natural gases *with a high methane content. See* Methane *or* natural gases, *etc.*							

Optional Hazardous Materials Table—Continued

(1)	(2)	(3)	(4)	(5)	(6)	(7) Vessel Stowage Requirements		
Notes and Symbols	Hazardous Materials Description and Proper Shipping Names	IMO Class	Identification Number	Label(s) required	Packaging Group	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Natural gasoline. *See* Casinghead gasoline							
	Neohexane. *See* Dimethyl butane							
	Neon, *compressed*	2.2	UN 1065	Nonflammable Gas	--	1,2	1,2	
	Neon, refrigerated liquid	2.2	UN 1913	Nonflammable Gas	--	1,2	1	
	Nickel carbonyl	6.1	UN 1259	Poison, Flammable Liquid	I	1	5	Keep cool. Prohibited on any ship carrying explosives except explosives in Division 1.4, Compatibility Group S. Shade from radiant heat. Segregation same as for flammable liquids
	Nickel catalyst, dry *precipitated on a carrier with a special activator*	4.2	UN 2881	Spontaneously Combustible	I	1,2	1	
	Nickel catalyst, wetted *with not less than 40% water or other suitable liquid, by weight, finely divided, activated, or spent*	4.2	UN 1378	Spontaneously Combustible	II	1,2	1	
	Nickel cyanide	6.1	UN 1653	Poison	II	1,2	1,2	
	Nickel nitrate	5.1	UN 2725	Oxidizer	III	1,2	1,2	
	Nickel nitrite	5.1	UN 2726	Oxidizer	III	1,2	1,2	Stow 'separated from' ammonium compounds and cyanides and 'away from' foodstuffs
	Nicotine (*and salts of*), liquid	6.1	UN 1654	Poison	I	1	1	
		6.1	UN 1654	Poison	II	1,2	1	
		6.1	UN 1654	St. Andrews Cross	III	1,2	1,2	
	Nicotine (*and salts of*), solid	6.1	UN 1654	Poison	I/II	1,2	1,2	
		6.1	UN 1654	St. Andrews Cross	III	1,2	1,2	
	Nicotine compounds, n.o.s. *or* Nicotine preparations, n.o.s.	6.1	UN 1655	Poison	I/II	1,2	1,2	
		6.1	UN 1655	St. Andrews Cross	III	1,2	1,2	
	Nicotine hydrochloride, *or* Nicotine hydrochloride solutions	6.1	UN 1656	Poison	II	1,2	1,2	
	Nicotine salicylate	6.1	UN 1657	Poison	II	1,2	1,2	
	Nicotine sulphate, solid *or* solution	6.1	UN 1658	Poison	II	1,2	1,2	
	Nicotine tartrate	6.1	UN 1659	Poison	II	1,2	1,2	
	Nitrate of soda and potash, mixture. *See* Sodium nitrate and potash, mixture							
	Nitrates, inorganic, n.o.s.	5.1	UN 1477	Oxidizer	II	1,2	1,2	Stow 'away from' powdered metals

	Nitrating acid, mixtures	8	UN 1796	Corrosive, Oxidiser (not required if nitric acid content not more than 50%)	I/II	1	5	Stow 'away from' fluorides
	Nitric acid, *other than red fuming, all concentrations*	8	UN 2031	Corrosive	I/II	1	5	Stow 'separated from' diethylene triamine. Stow 'away from' hydrazine, fluorides, and all other corrosives except sulphuric acid and sulphur trioxide
	Nitric acid, red fuming	8	UN 2032	Corrosive, Oxidiser, Poison	I	1	5	Stow 'separated from' diethylene triamine. Stow 'away from' hydrazine, fluorides and all other corrosives except sulphuric acid and sulphur trioxide
	Nitric oxide	2.3	UN 1660	Poison Gas	–	1	5	
	Nitric oxide and nitrogen tetroxide mixtures	2.3	UN 1975	Poison Gas, Oxidiser	–	1	5	Stow 'away from' organic materials
	Nitrites, inorganic, n.o.s.	5.1	UN 2627	Oxidiser	II	1,2	1,2	Stow 'separated from' ammonium compounds and cyanides and 'away from' powdered metals and foodstuffs
	Nitroanilines *(o-, m-, p-)*	6.1	UN 1661	Poison	II	1,2	1,2	
	Nitroanisoles	6.1	UN 2730	St. Andrews Cross	III	1,3	1,3	Keep cool
	Nitrobenzene	6.1	UN 1662	Poison	II	1,2	1,2	Stow 'away from' living quarters
	Nitrobenzenesulphonic acid	8	UN 2305	Corrosive	II	1,2	1,2	
	Nitrobenzol. *See* Nitrobenzene							
N	5-Nitrobenzotriazol	1.1D	UN 0385	Explosive (1.1D)	–	–	–	
	Nitrobenzotrifluorides	6.1	UN 2306	Poison	II	1,2	1,2	Stow 'away from' living quarters
	Nitrobromobenzenes	6.1	UN 2732	St. Andrews Cross	III	1,3	1,3	Keep cool
	Nitrocellulose, *containing at least 25% alcohol, by weight, and not exceeding 12.6% nitrogen by dry weight*	4.1	UN 2556	Flammable Solid	I	1	5	Shade from radiant heat, keep away from heat and open flame
	Nitrocellulose, *containing at least 25%, by weight, water*	4.1	UN 2555	Flammable Solid	II	1	5	Shade from radiant heat. Keep away from heat and open flame
	Nitrocellulose, *containing at least 18% plasticizing substance, by weight, and not exceeding 12.6% nitrogen by dry weight*	4.1	UN 2557	Flammable Solid	I	1	1	Shade from radiant heat. Keep away from heat and open flame
N	Nitrocellulose *dry or wetted with less than 25% alcohol, by weight*	1.1D	UN 0340	Explosive (1.1D)	–	–	–	
N	Nitrocellulose, *dry or wetted with less than 25% water, by weight*	1.1D	UN 0340	Explosive (1.1D)	–	–	–	
	Nitrocellulose, *in solution in flammable liquids*	3.2 3.3	UN 2059 UN 2060	Flammable Liquid Flammable Liquid	II II	1,2 1,2	1 1,2	
N	Nitrocellulose, *plasticized with not less than 18% plasticizing substance, by weight*	1.3C	UN 0343	Explosive (1.3C)	–	–	–	
N	Nitrocellulose *unmodified or unplasticized with less than 18% plasticizing substance, by weight*	1.1D	UN 0341	Explosive (1.1D)	–	–	–	
	Nitrocellulose, *wetted with, by weight, more than 40% flammable liquids*	3.2 3.3	(UN 2556) (UN 2556)	Flammable Liquid Flammable Liquid	II II	1,2 1,2	1 1,2	
N	Nitrocellulose, *wetted with not less than 25% alcohol, by weight*	1.3C	UN 0342	Explosive (1.3C)	–	–	–	
	3-Nitro-4-chlorobenzotrifluoride	6.1	UN 2307	Poison	II	1,2	1,2	Stow 'away from' living quarters
	Nitrocresols	6.1	UN 2446	St. Andrews Cross	III	1,2	1,2	Stow 'away from' living quarters
	Nitroethane	3.3	UN 2842	Flammable Liquid	III	1,3	1,2	

Optional Hazardous Materials Table—Continued

(1)	(2)	(3)	(4)	(5)	(6)	(7) Vessel Stowage Requirements		
Notes and Symbols	Hazardous Materials Description and Proper Shipping Names	IMO Class	Identification Number	Label(s) required	Packaging Group	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Nitrogen, *compressed*	2.2	UN 1066	Nonflammable Gas	–	1,2	1,2	
	Nitrogen dioxide, *liquefied*	2.3	UN 1067	Poison Gas, Oxidizer	–	1	5	Stow 'away from' foodstuffs, organic materials and living quarters
	Nitrogen, refrigerated liquid	2.2	UN 1977	Nonflammable Gas	–	1,3	1,3	
	Nitrogen tetroxide. *See* Nitrogen dioxide							
	Nitrogen trifluoride	2.3	UN 2451	Poison Gas	–	1	5	Stow 'away from' living quarters and organic materials
	Nitrogen trioxide	2.3	UN 2421	Poison Gas	–	1	5	Stow 'away from' living quarters and readily combustible substances
N	Nitroglycerine, desensitized, *with not less than 40% non-volatile water-insoluble phlegmatizer, by weight*	1.1D	UN 0143	Explosive (1.1D), Poison	–	–	–	
N	Nitroglycerine, spirit of, *with more than 1% but not more than 10% nitroglycerine in solution in alcohol*	1.1D	UN 0144	Explosive (1.1D)	–	–	–	
	Nitroglycerin solution, in alcohol *with not more than 1% nitroglycerin*	3.2	UN 1204	Flammable Liquid	II	1,2	1	
N	Nitroguanidine, *dry or containing, by weight, less than 20% water*	1.1D	UN 0282	Explosive (1.1D)	–	–	–	
	Nitroguanidine, wetted, with, *by weight, at least 20% water*	4.1	UN 1336	Flammable Solid	I	1,2	5	
	Nitrohydrochloric acid	8	UN 1798	Corrosive	I	1	5	Stow 'away from' fluorides
	Nitromethane	3.3	UN 1261	Flammable Liquid	II	1,2	1,2	
	Nitromuriatic acid. *See* Nitrohydrochloric acid							
	Nitronapthalene	4.1	UN 2538	Flammable Solid	III	1,2	1,2	
	Nitrophenols *(o-, m-, p-)*	6.1	UN 1663	St. Andrews Cross	III	1,2	1,2	
	Nitropropanes	3.3	UN 2608	Flammable Liquid	III	1,2	1,2	
	p-Nitrosodimethylaniline	4.2	UN 1369	Spontaneously Combustible	II	1,2	5	Stow 'away from' foodstuffs
N	Nitrostarch, *dry or containing, by weight, less than 20% water*	1.1D	UN 0146	Explosive (1.1D)	–	–	–	
	Nitrostarch, wetted with, *by weight, at least 20% water*	4.1	UN 1337	Flammable Solid	I	1	5	
	Nitrosyl chloride	2.3	UN 1069	Poison Gas, Corrosive	–	1	5	Stow 'away from' foodstuffs and living quarters
	Nitrosylsulphuric acid	8	UN 2308	Corrosive	II	1	5	Stow 'away from' organic materials
	Nitrotoluenes *(o-, m-, p-)*	6.1	UN 1664	Poison	II	1,2	1,2	
N	Nitro urea	1.1D	UN 0147	Explosive (1.1D)	–	–	–	
	Nitrous oxide, *compressed*	2.2	UN 1070	Nonflammable Gas, Oxidizer	–	1,2	1,2	

	Nitrous oxide, refrigerated liquid	2.2	UN 2201	Nonflammable Gas	–	1,2	1	
	Nitroxylenes *(o-, m-, p-)*	6.1	UN 1665	Poison	II	1,2	1,2	
	Nonane, *and its isomers*	3.3	UN 1920	Flammable Liquid	II	1,2	1,2	
	Nonyl trichlorosilane	8	UN 1799	Corrosive	II	1	1	Keep dry
	Octadecyl trichlorosilane	8	UN 1800	Corrosive	II	1	1	Keep dry
	Octadiene	3.2	UN 2309	Flammable Liquid	III	1,2	1	
	Octafluorobut-2-ene	2.2	UN 2422	Nonflammable Gas	–	1,2	1,2	
	Octafluorocyclobutane	2.2	UN 1976	Nonflammable Gas	–	1,2	1,2	
	Octafluoropropane	2.2	UN 2424	Nonflammable Gas	–	1,2	1,2	
	Octane *and its isomers*	3.2	UN 1262	Flammable Liquid	II	1,2	1	
	n-Octanoyl peroxide. *See* Di-n-octanoyl peroxide				–	–	–	
N	Octolite, *dry or wetted with less than 15% water, by weight*	1.1D	UN 0266	Explosive (1.1D)	–	–	–	
	Octyl trichlorosilane	8	UN 1801	Corrosive	II	1	1	Keep dry
	Oil gas	2.1	UN 1071	Flammable Gas, Poison Gas	–	1	5	Stow 'away from' living quarters
	Oleum. *See* Sulphuric acid, fuming							
	Organic peroxides, mixture *(this description must be supplemented with the name of the primary constituent of the mixture)*	5.2	UN 2756	Organic Peroxide	I/II	1	5	
	Organic peroxides, n.o.s., samples	5.2	UN 2255	Organic Peroxide	I/II	1	5	
	Organic peroxides, n.o.s., trial quantities	5.2	UN 2899	Organic Peroxide	–	1	5	
	Organochlorine pesticides, liquid, flammable, toxic, n.o.s., *flashpoint less than 23 deg C*	3.2	UN 2762	Flammable Liquid and Poison or St. Andrews Cross (according to toxicity)	I/II	1,2	1	
	Organochlorine pesticides, liquid, toxic, flammable, n.o.s., *flashpoint between 23 deg C and 61 deg C*	6.1	UN 2995	Poison, Flammable Liquid	I	1	1	Segregation same as for flammable liquids
		6.1	UN 2995	Poison, Flammable Liquid	II	1,2	1	Segregation same as for flammable liquids
		6.1	UN 2995	St. Andrews Cross, Flammable Liquid	III	1,2	1,2	Segregation same as for flammable liquids
	Organochlorine pesticides, liquid, toxic, n.o.s.	6.1	UN 2996	Poison	I	1	1	
		6.1	UN 2996	Poison	II	1,2	1	
		6.1	UN 2996	St. Andrews Cross	III	1,2	1,2	
	Organochlorine pesticides, solid, toxic, n.o.s.	6.1	UN 2761	Poison	I/II	1,2	1,2	
		6.1	UN 2761	St. Andrews Cross	III	1,2	1,2	
	Organophosphorus pesticides, liquid, flammable, toxic, n.o.s., *flashpoint less than 23 deg C*	3.2	UN 2784	Flammable Liquid and Poison or St. Andrews Cross (according to toxicity)	I/II	1,2	1	
	Organophosphorus pesticides, liquid, toxic, flammable, n.o.s., *flashpoint between 23 deg C and 61 deg C*	6.1	UN 3017	Poison, Flammable Liquid	I	1	1	Segregation same as for flammable liquids
		6.1	UN 3017	Poison, Flammable Liquid	II	1,2	1	Segregation same as for flammable liquids
		6.1	UN 3017	St. Andrews Cross, Flammable Liquid	III	1,2	1,2	Segregation same as for flammable liquids

Optional Hazardous Materials Table—Continued

(1) Notes and Symbols	(2) Hazardous Materials Description and Proper Shipping Names	(3) IMO Class	(4) Identification Number	(5) Label(s) required	(6) Packaging Group	(7) Vessel Stowage Requirements (a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Organophosphorus pesticides, liquid, toxic, n.o.s.	6.1	UN 3018	Poison	I	1	1	
		6.1	UN 3018	Poison	II	1,2	1	
		6.1	UN 3018	St. Andrews Cross	III	1,2	1,2	
	Organophosphorus pesticides solid, toxic, n.o.s.	6.1	UN 2783	Poison	I/II	1,2	1,2	
		6.1	UN 2783	St. Andrews Cross	III	1,2	1,2	
	Organotin compounds, n.o.s.	6.1	UN 2788	Poison	I/II	1,2	1	Stow 'away from' living quarters
		6.1	UN 2788	St. Andrews Cross	III	1,2	1	
	Organotin pesticides, liquid, flammable, toxic, n.o.s., *flashpoint below 23 deg C*	3.2	UN 2787	Flammable Liquid and Poison or St. Andrews Cross (according to toxicity)	I/II	1,2	1	
	Organotin pesticides, liquid, toxic, flammable, n.o.s., *flashpoint between 23 deg C and 61 deg C*	6.1	UN 3019	Poison, Flammable Liquid	I	1	1	Segregation same as for flammable liquids
		6.1	UN 3019	Poison, Flammable Liquid	II	1,2	1	Segregation same as for flammable liquids
		6.1	UN 3019	St. Andrews Cross, Flammable Liquid	III	1,2	1,2	Segregation same as for flammable liquids
	Organotin pesticides, liquid, toxic, n.o.s.	6.1	UN 3020	Poison	I	1	1	
		6.1	UN 3020	Poison	II	1,2	1	
		6.1	UN 3020	St. Andrews Cross	III	1,2	1,2	
	Organotin pesticides, solid, toxic, n.o.s.	6.1	UN 2786	Poison	I/II	1,2	1,2	
		6.1	UN 2786	St. Andrews Cross	III	1,2	1,2	
	Osmium tetroxide	6.1	UN 2471	Poison	I	1,2	1	Stow 'away from' living quarters
	Oxalates, *water soluble*	6.1	UN 2449	St. Andrews Cross	III	1,2	1,2	
	Oxidizing substances, n.o.s.	5.1	UN 1479	Oxidizer	I/II/III	1,2	1,2	Stow 'separated from' ammonium compounds and 'away from' powdered metals
	Oxygen and carbon dioxide, mixtures. See Carbon dioxide and oxygen *mixtures*							
	Oxygen, *compressed*	2.2	UN 1072	Nonflammable Gas, Oxidizer	–	1,2	1,2	
	Oxygen difluoride	2.3	UN 2190	Poison Gas	–	1	5	Keep dry. Stow 'away from' living quarters and readily combustible substances
	Oxygen, *refrigerated liquid*	2.2	UN 1073	Nonflammable Gas, Oxidizer	–	1	5	Stow 'separated from' acetylene. Do not overstow

	Paints, enamels, lacquers, stains, shellac *solutions*, varnish, polishes, fillers *liquid*, lacquer base *or* thinners	3.2	UN 1263	Flammable Liquid	II/III	1,2	1	
		3.3	UN 1263	Flammable Liquid	II/III	1,2	1,2	
	Paper, unsaturated oil treated, *incompletely dried*	4.2	UN 1379	Spontaneously Combustible	III	1,2	1,2	
	Paraformaldehyde	4.1	UN 2213	None. Package to be marked 'Class 4.1'	III	1,2	1,2	
	Paraldehyde	3.3	UN 1264	Flammable Liquid	III	1,2	1,2	
	Pentaborane	4.2	UN 1380	Spontaneously Combustible, Poison	I	1	5	
	Pentachloroethane	6.1	UN 1669	Poison	II	1,2	1,2	
N	Pentaerythrite tetranitrate, wetted *with not less than 25% water, by weight, or desensitized with not less than 15% phlegmatizer, by weight*	1.1D	UN 0150	Explosive (1.1D)	—	—	—	
N	Pentaerythrite tetranitrate, *with not less than 7% wax, by weight*	1.1D	UN 0411	Explosive (1.1D)	—	—	—	
	Pentamethylheptane	3.3	UN 2286	Flammable Liquid	III	1,2	1,2	
	2,4-Pentanedione	3.3	UN 2310	Flammable Liquid	III	1,2	1,2	
	Pentanes	3.1	UN 1265	Flammable Liquid	I	1,3	5	Keep cool
	1-Pentol	8	UN 2705	Corrosive	II	1,2	1	Stow 'away from' all other corrosives
N	Pentolite, *dry or wetted with less than 15% water, by weight*	1.1D	UN 0151	Explosive (1.1D)	—	—	—	
	Perchlorates, inorganic, n.o.s.	5.1	UN 1481	Oxidizer	II	1,2	1,2	Stow 'away from' powdered metals and 'separated from' ammonium compounds
	Perchloric acid, *not exceeding 50%, by weight, of acid*	8	UN 1802	Corrosive, Oxidizer	II	1	1	Stow 'away from' hydrazine
	Perchloric acid, *over 50% and not exceeding 72% of acid*	5.1	UN 1873	Oxidizer, Corrosive	I	1	5	
	Perchloroethylene. *See* Tetrachloroethylene							
	Perchloromethyl mercaptan	6.1	UN 1670	Poison	I	1	5	Stow 'away from' living quarters
	Perfumery products, *with flammable solvents*	3.2	UN 1266	Flammable Liquid	II	1,2	1	
		3.3	UN 1266	Flammable Liquid	II	1,2	1,2	
	Permanganates, inorganic, n.o.s.	5.1	UN 1482	Oxidizer	II	1,2	1,2	Stow 'separated from' ammonium compounds and hydrogen peroxide
	Peroxides, inorganic, n.o.s.	5.1	UN 1483	Oxidizer	II	1,2	1	Stow 'away from' powdered metals. Keep dry
	Peroxyacetic acid, *maximum concentration 43% in acetic acid or in a mixture of acetic acid and water, with in either case not more than 6% hydrogen peroxide and not more than 1% sulphuric acid*	5.2	UN 2131	Organic Peroxide, Corrosive	I	1	5	
	Pesticides, liquid, flammable, toxic, n.o.s. *flashpoint below 23 deg C*	3.2	UN 3021	Flammable Liquid and Poison or St. Andrews Cross (according to toxicity)	I/II	1,2	1	
	Pesticides, liquid, toxic, flammable, n.o.s. *flashpoint between 23 deg C and 61 deg C*	6.1	UN 2903	Poison, Flammable Liquid	I	1	1	Segregation same as for flammable liquids
		6.1	UN 2903	Poison, Flammable Liquid	II	1,2	1	Segregation same as for flammable liquids
		6.1	UN 2903	St. Andrews Cross, Flammable Liquid	III	1,2	1,2	Segregation same as for flammable liquids
	Pesticides, liquid, toxic, n.o.s.	6.1	UN 2902	Poison	I	1	1	
		6.1	UN 2902	Poison	II	1,2	1	

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Optional Hazardous Materials Table—Continued

(1)	(2)	(3)	(4)	(5)	(6)	(7) Vessel Stowage Requirements		
Notes and Symbols	Hazardous Materials Description and Proper Shipping Names	IMO Class	Identification Number	Label(s) required	Packaging Group	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
		6.1	UN 2902	St. Andrews Cross	III	1,2	1,2	
	Pesticides, solid, toxic, n.o.s.	6.1	UN 2588	Poison	I/II	1,2	1,2	
		6.1	UN 2588	St. Andrews Cross	III	1,2	1,2	
	Petroleum crude oil	3.1	UN 1267	Flammable Liquid	II	1,3	5	Keep cool
		3.2	UN 1267	Flammable Liquid	II	1,2	1	
		3.3	UN 1267	Flammable Liquid	II	1,2	1,2	
	Petroleum distillates, n.o.s.	3.1	UN 1268	Flammable Liquid	II	1,3	5	Keep cool
		3.2	UN 1268	Flammable Liquid	II	1,2	1	
		3.3	UN 1268	Flammable Liquid	II	1,2	1,2	
	Petroleum ether. *See* Petroleum spirit							
	Petroleum gases, liquefied	2.1	UN 1075	Flammable Gas	--	1,2	1	
	Petroleum oil	3.1	UN 1270	Flammable Liquid	II	1,3	5	Keep cool
		3.2	UN 1270	Flammable Liquid	II	1,2	1	
		3.3	UN 1270	Flammable Liquid	II	1,2	1,2	
	Petroleum spirit	3.1	UN 1271	Flammable Liquid	II	1,3	5	Keep cool
		3.2	UN 1271	Flammable Liquid	II	1,2	1	
		3.3	UN 1271	Flammable Liquid	II	1,2	1,2	
	Petrol. *See* Gasoline							
	Phenacyl bromide	6.1	UN 2645	Poison	II	1,3	1	Keep cool. Stow 'away from' living quarters
	Phenetidines (*o*-, *p*-)	6.1	UN 2311	St. Andrews Cross	III	1,2	1,2	
	Phenol	6.1	UN 1671	Poison	II	1,2	1,2	
	Phenol, molten	6.1	UN 2312	Poison	II	1	1	
	Phenol solutions	6.1	UN 2821	Poison	II	1,2	1,2	Stow 'away from' living quarters
	Phenolsulphonic acid, *liquid*	8	UN 1803	Corrosive	II	1,2	1	Metal drums only under deck
	Phenoxy pesticides, solid, toxic, n.o.s.	6.1	UN 2765	Poison	I/II	1,2	1,2	
		6.1	UN 2765	St. Andrews Cross	III	1,2	1,2	

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Phenoxy pesticides, liquid, flammable, toxic, n.o.s., *flashpoint less than 23 deg C*	3.2	UN 2766	Flammable Liquid and Poison or St. Andrews Cross (according to toxicity)	I/II	1,2	1	
Phenoxy pesticides, liquid, toxic, flammable, n.o.s., *flashpoint between 23 deg C and 61 deg C*	6.1	UN 2999	Poison, Flammable Liquid	I	1	1	Segregation same as for flammable liquids
	6.1	UN 2999	Poison, Flammable Liquid	II	1,2	1	Segregation same as for flammable liquids
	6.1	UN 2999	St. Andrews Cross, Flammable Liquid	III	1,2	1,2	Segregation same as for flammable liquids
Phenoxy pesticides, liquid, toxic, n.o.s	6.1	UN 3000	Poison	I	1	1	
	6.1	UN 3000	Poison	II	1,2	1	
	6.1	UN 3000	St. Andrews Cross	III	1,2	1,2	
Phenylacetonitrile, liquid	6.1	UN 2470	St. Andrews Cross	III	1,2	1,2	Stow 'away from' acids
Phenylacetyl chloride	8	UN 2577	Corrosive	II	1	1	Keep dry
Phenylcarbylamine chloride	6.1	UN 1672	Poison	I	1	5	Stow 'away from' living quarters
Phenylchloroformate	6.1	UN 2746	Poison, Corrosive	II	1,3	1,3	Keep cool and dry. Shade from radiant heat. Stow 'away from' living quarters
Phenylenediamines *(o-, m-, p-)*	6.1	UN 1673	St. Andrews Cross	III	1,2	1,2	
Phenylhydrazine	6.1	UN 2572	Poison	II	1,2	1,2	Stow 'away from' living quarters
Phenyl isocyanate	6.1	UN 2487	Poison, Flammable Liquid	II	1	5	Shade from radiant heat. Stow 'away from' living quarters. Segregation same as for flammable liquids
Phenyl mercaptan	6.1	UN 2337	Poison, Flammable Liquid	I	1,2	1	Segregation same as for flammable liquids
Phenylmercuric acetate	6.1	UN 1674	Poison	II	1,2	1,2	
Phenylmercuric compounds, n.o.s.	6.1	UN 2026	Poison	I/II	1,2	1,2	
	6.1	UN 2026	St. Andrews Cross	III	1,2	1,2	
Phenylmercuric hydroxide	6.1	UN 1894	Poison	II	1,2	1,2	
Phenylmercuric nitrate	6.1	UN 1895	Poison	II	1,2	1,2	
Phenyl phosphorus dichloride	8	UN 2798	Corrosive	II	1,2	1	
Phenyl phosphorus thiodichloride	8	UN 2799	Corrosive	II	1,2	1	
Phenyl trichlorosilane	8	UN 1804	Corrosive	II	1	1	Keep dry
Phenyl urea pesticides, liquid, flammable, toxic, n.o.s., *flashpoint less than 23 deg C*	3.2	UN 2768	Flammable Liquid and Poison or St. Andrews Cross (according to toxicity)	I/II	1,2	1	
Phenyl urea pesticides, liquid, toxic, flammable, n.o.s., *flashpoint between 23 deg C and 61 deg C*	6.1	UN 3001	Poison, Flammable Liquid	I	1	1	Segregation same as for flammable liquids
	6.1	UN 3001	Poison, Flammable Liquid	II	1,2	1	Segregation same as for flammable liquids
	6.1	UN 3001	St. Andrews Cross, Flammable Liquid	III	1,2	1,2	Segregation same as for flammable liquids
Phenyl urea pesticides, liquid, toxic, n.o.s.	6.1	UN 3002	Poison	I	1	1	
	6.1	UN 3002	Poison	II	1,2	1	

Optional Hazardous Materials Table—Continued

(1)	(2)	(3)	(4)	(5)	(6)	(7)		
						Vessel Stowage Requirements		
Notes and Symbols	Hazardous Materials Description and Proper Shipping Names	IMO Class	Identification Number	Label(s) required	Packaging Group	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
		6.1	UN 3002	St. Andrews Cross	III	1,2	1,2	
	Phenyl urea pesticides, solid, toxic, n.o.s.	6.1	UN 2767	Poison	I/II	1,2	1,2	
		6.1	UN 2767	St. Andrews Cross	III	1,2	1,2	
	Phosgene	2.3	UN 1076	Poison Gas, Corrosive	–	1	5	
	9-Phosphabicyclononanes	4.2	UN 2940	Spontaneously Combustible	II	1,2	1,2	
	Phosphine	2.3	UN 2199	Poison Gas, Flammable Gas	–	1	5	Stow 'away from' living quarters
	Phosphoric acid, *liquid*	8	UN 1805	Corrosive	III	1,2	1,2	Glass carboys in hampers prohibited under deck
	Phosphoric acid, *solid*	8	UN 1805	Corrosive	III	1,2	1,2	
	Phosphoric anhydride. *See* Phosphorus pentoxide							
	Phosphorous acid, ortho	8	UN 2834	Corrosive	III	1,3	1,3	Stow 'away from' sources of heat. Keep dry
	Phosphorous bromide. *See* Phosphorus tribromide							
	Phosphorous chloride. *See* Phosphorus trichloride							
	Phosphorus, amorphous	4.1	UN 1338	Flammable Solid	III	1,2	1,2	
	Phosphorus heptasulphide, *free from yellow or white phosphorus*	4.1	UN 1339	Flammable Solid	II	1,2	1	Stow 'separated from' oxidizing substances
	Phosphorus oxybromide, molten	8	UN 2576	Corrosive	II	1	1	Keep dry
	Phosphorus oxybromide, solid	8	UN 1939	Corrosive	II	1	1	Keep cool and dry
	Phosphorus oxychloride	8	UN 1810	Corrosive	II	1	1	Keep dry
	Phosphorus pentabromide	8	UN 2691	Corrosive	II	1,3	1	Keep cool and dry
	Phosphorus pentachloride	8	UN 1806	Corrosive	II	1	1	Keep dry
	Phosphorus pentafluoride	2.3	UN 2198	Poison Gas	–	1	5	Stow 'away from' living quarters
	Phosphorus pentasulphide, *free from yellow or white phosphorus*	4.1	UN 1340	Flammable Solid	II	1,2	1,2	Stow 'separated from' oxidizing substances
	Phosphorus pentoxide	8	UN 1807	Corrosive	II	1,2	1,2	Glass bottles prohibited under deck
	Phosphorus sesquisulphide, *free from yellow or white phosphorus*	4.1	UN 1341	Flammable Solid	II	1,2	1	Stow 'separated from' oxidizing substances
	Phosphorus tribromide	8	UN 1808	Corrosive	II	1	1	Keep dry. Glass carboys prohibited on passenger vessels
	Phosphorus trichloride	8	UN 1809	Corrosive	II	1	1	Keep dry. Glass carboys prohibited on passenger vessels
	Phosphorus trioxide	8	UN 2578	Corrosive	III	1,3	1,3	Keep cool and dry
	Phosphorus trisulphide, *free from yellow or white phosphorus*	4.1	UN 1343	Flammable Solid	II	1,2	1	Stow 'separated from' oxidizing substances
	Phosphorus, white, molten	4.2	UN 2447	Spontaneously Combustible, Poison	I	1	5	

	Phosphorus, *white or yellow, dry*	4.2	UN 1381	Spontaneously Combustible	I	1,2	5	
	Phosphorus, *white or yellow, in water*	4.2	UN 1381	Spontaneously Combustible	I	1,2	5	
N	Photo-flash powder *in units*	1.1G	UN 0094	Explosive (1.1G)	–	–	–	
N	Photo-flash powder *in units*	1.2G	UN 0096	Explosive (1.2G)	–	–	–	
N	Photo-flash powder *in units*	1.3G	UN 0305	Explosive (1.3G)	–	–	–	
	Phthalic anhydride, *solid or molten*	8	UN 2214	None. Package to be marked 'Class 8'	III	1,2	1,2	Stow 'away from' foodstuffs
	Phthalimide derivative pesticides, liquid, flammable, toxic, n.o.s., *flashpoint below 23 deg C*	3.2	UN 2774	Flammable Liquid and Poison or St. Andrews Cross (according to toxicity)	I/II	1,2	1	
	Phthalimide derivative pesticides, liquid, toxic, flammable, n.o.s., *flashpoint between 23 deg C and 61 deg C*	6.1	UN 3007	Poison, Flammable Liquid	I	1	1	Segregation same as for flammable liquids
		6.1	UN 3007	Poison, Flammable Liquid	II	1,2	1	Segregation same as for flammable liquids
		6.1	UN 3007	St. Andrews Cross, Flammable Liquid	III	1,2	1,2	Segregation same as for flammable liquids
	Phthalimide derivative pesticides, liquid, toxic, n.o.s.	6.1	UN 3008	Poison	I	1	1	
		6.1	UN 3008	Poison	II	1,2	1	
		6.1	UN 3008	St. Andrews Cross	III	1,2	1,2	
	Phthalimide derivative pesticides, solid, toxic, n.o.s.	6.1	UN 2773	Poison	I/II	1,2	1,2	
		6.1	UN 2773	St. Andrews Cross	III	1,2	1,2	
	Picolines	3.3	UN 2313	Flammable Liquid	II	1,2	1,2	
	Picric acid, wetted. *See* Trinitrophenol, wetted							
	Pinanyl hydroperoxide *technical pure*	5.2	UN 2162	Organic Peroxide	I	1	5	
	Pindone *(and salts of), liquid*	6.1	UN 2672	Poison	I	1	1	
		6.1	UN 2672	Poison	II	1,2	1	
		6.1	UN 2472	St. Andrews Cross	III	1,2	1,2	
	Pindone *(and salts of), solid*	6.1	UN 2672	Poison	I/II	1,2	1,2	
		6.1	UN 2472	St. Andrews Cross	III	1,2	1,2	
	alpha-Pinene	3.3	UN 2368	Flammable Liquid	III	1,2	1,2	
	Pine oil	3.3	UN 1272	Flammable Liquid	III	1,2	1,2	
	Piperazine	8	UN 2579	Corrosive	III	1,3	1,3	Keep cool and dry
	Piperidine	3.2	UN 2401	Flammable Liquid	II	1,2	1	Keep dry
	Plastics moulding materials evolving flammable vapours	9	UN 2211	None	III	1,2	1,2	
	Plastics, nitrocellulose-based, spontaneously combustible, n.o.s.	4.2	UN 2006	Spontaneously Combustible	III	1	1	
	Poisonous liquids, corrosive, n.o.s.	6.1	UN 2927	Poison, Corrosive	I/II	1,2	1	Segregation same as for corrosives
	Poisonous liquids, flammable, n.o.s.	6.1	UN 2929	Poison, Flammable Liquid	I/II	1,2	1	Segregation same as for flammable liquids
	Poisonous liquids, n.o.s.	6.1	UN 2810	Poison	I/II	1,2	1	
		6.1	UN 2810	St. Andrews Cross	III	1,2	1	

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Optional Hazardous Materials Table—Continued

(1) Notes and Symbols	(2) Hazardous Materials Description and Proper Shipping Names	(3) IMO Class	(4) Identification Number	(5) Label(s) required	(6) Packaging Group	(7) Vessel Stowage Requirements (a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Poisonous solids, corrosive, n.o.s.	6.1	UN 2928	Poison, Corrosive	I/II	1,2	1	Segregation same as for corrosives
	Poisonous solids, flammable, n.o.s.	6.1	UN 2930	Poison, Flammable Solid	I/II	1,2	1	Segregation same as for flammable solids
	Poisonous solids, n.o.s.	6.1	UN 2811	Poison	I/II	1,2	1	
		6.1	UN 2811	St. Andrews Cross	III	1,2	1	
	Polishes. *See* Paints, *etc.*							
	Polishing fluid. *See* Flammable liquid preparations, n.o.s.							
	Polychlorinated biphenyls	9	UN 2315	None	II	1,2	1,2	Stow in a recoverable position. Stow 'away from' foodstuffs
	Polystyrene beads, expandable, impregnated with flammable liquid. See Plastics moulding materials evolving flammable vapours							
	Potassium arsenate	6.1	UN 1677	Poison	II	1,2	1,2	
	Potassium arsenite	6.1	UN 1678	Poison	II	1,2	1,2	
	Potassium bifluoride, *solid*	8	UN 1811	Corrosive, Poison	II	1,2	1,2	
	Potassium bifluoride, *solution*	8	UN 1811	Corrosive, Poison	II	1,2	1,2	
	Potassium borohydride	4.3	UN 1870	Dangerous When Wet	I	1,2	5	
	Potassium bromate	5.1	UN 1484	Oxidizer	II	1,2	1,2	Stow 'separated from' ammonium compounds and 'away from' powdered metals
	Potassium chlorate	5.1	UN 1485	Oxidizer	II	1,2	1,2	Stow 'separated from' ammonium compounds and 'away from' powdered metals
	Potassium chlorate, *aqueous solution*	5.1	UN 2427	Oxidizer	II	1,2	1	Stow 'away from' powdered metals and 'separated from' ammonium compounds
	Potassium cuprocyanide	6.1	UN 1679	Poison	II	1,2	1,2	Stow 'away from' acids
	Potassium cyanide	6.1	UN 1680	Poison	I	1,2	1,2	Stow 'away from' acids
	Potassium fluoride	6.1	UN 1812	St. Andrews Cross	III	1,2	1,2	Stow 'away from' acids
	Potassium fluoroacetate	6.1	UN 2628	Poison	I	1,2	5	Stow 'away from' living quarters
	Potassium hydrogen fluoride. *See* Potassium bifluoride							
	Potassium hydrogen sulphate	8	UN 2509	Corrosive	II	1,2	1,2	Stow 'away from' strong alkalis
	Potassium hydrosulphite	4.2	UN 1929	Spontaneously Combustible	II	1,2	5	Keep dry
	Potassium hydroxide, solid	8	UN 1813	Corrosive	II	1,2	1,2	Keep dry
	Potassium hydroxide, solution	8	UN 1814	Corrosive	II	1,2	1,2	
	Potassium hypochlorite, *solution. See* Hypochlorite, solutions, *etc.*							

	Potassium metal	4.2	UN 2257	Spontaneously Combustible	II	1,2	5	
	Potassium, metal alloys	4.3	UN 1420	Dangerous When Wet	II	1,2	5	
	Potassium metavanadate	6.1	UN 2864	Poison	II	1,2	1,2	Stow 'away from' living quarters
	Potassium nitrate	5.1	UN 1486	Oxidizer	III	1,2	1,2	
	Potassium nitrate and sodium nitrite, mixture	5.1	UN 1487	Oxidizer	II	1,2	1,2	Stow 'separated from' ammonium compounds and cyanides, and 'away from' foodstuffs
	Potassium nitrate bags, *empty. See* Bags, *empty and unwashed, etc.*							
	Potassium nitrite	5.1	UN 1488	Oxidizer	II	1,2	1,2	Stow 'separated from' ammonium compounds and cyanides, and 'away from' foodstuffs
	Potassium oxide	8	UN 2033	Corrosive	II	1,2	1,2	Keep dry
	Potassium perchlorate	5.1	UN 1489	Oxidizer	II	1,2	1,2	Stow 'away from' powdered metals
	Potassium permanganate	5.1	UN 1490	Oxidizer	II	1,2	1,2	Stow 'separated from' ammonium compounds and hydrogen peroxide
	Potassium peroxide	5.1	UN 1491	Oxidizer	I	1,2	1,2	Keep dry
	Potassium persulphate	5.1	UN 1492	Oxidizer	III	1,2	1,2	
	Potassium phosphide	4.3	UN 2012	Dangerous When Wet, Poison	I	1,2	5	When stowed under deck, stow in a mechanically ventilated space
N	Potassium salts of nitro-aromatic derivatives, *explosive*	1.3C	UN 0158	Explosive (1.3C)	–	–	–	
	Potassium silicofluoride	6.1	UN 2655	St. Andrews Cross	III	1,2	1,2	Stow 'away from' acids
	Potassium-sodium, *alloy*	4.3	UN 1422	Dangerous When Wet	I	1,2	5	
	Potassium sulphide, anhydrous *or* Potassium sulphide *with less than 30% water of crystallization*	4.2	UN 1382	Spontaneously Combustible	II	1,2	1,2	Stow 'separated from' liquid acids
	Potassium sulphide, hydrated, *with not less than 30% water of crystallization*	8	UN 1847	Corrosive	II	1,2	1,2	Stow 'away from' acids
	Potassium superoxide	5.1	UN 2466	Oxidizer	I	1,2	1	Keep dry. Stow 'away from' combustible materials including packaging of other cargo
N	Powder cake, wetted *with not less than 35% water, by weight*	1.3C	UN 0159	Explosive (1.3C)	–	–	–	
N	Powder, smokeless	1.1C	UN 0160	Explosive (1.1C)	–	–	–	
N	Powder, smokeless	1.3C	UN 0161	Explosive (1.3C)	–	–	–	
	Primers, cap type	1.4B	UN 0378	Explosive (1.4B)	–	1,3	1,3	
	Primers, cap type	1.4S	UN 0044	None. Package to be marked '1.4S'	–	1,3	1,3	
N	Primers, cap type	1.1B	UN 0377	Explosive (1.1B)	–	–	–	
	Primers, tubular	1.4G	UN 0320	Explosive (1.4G)	–	1,3	1,3	
	Primers, tubular	1.4S	UN 0376	None. Package to be marked '1.4S'	–	1,3	1,3	
N	Primers, tubular	1.3G	UN 0319	Explosive (1.3G)	–	–	–	
	Projectiles, *inert, with tracer*	1.4 S	UN 0345	None. Package to be marked '1.4 S'	–	1,3	1,3	
N	Projectiles, *inert, with tracer*	1.3G	UN 0424	Explosive (1.3G)	–	–	–	
	Projectiles, *inert, with tracer*	1.4G	UN 0425	Explosive (1.4G)	–	1,3	1,3	
N	Projectiles, *with burster or expelling charge*	1.2D	UN 0346	Explosive (1.2D)	–	–	–	
N	Projectiles, *with burster or expelling charge*	1.2F	UN 0426	Explosive (1.2F)	–	–	–	
N	Projectiles, *with burster or expelling charge*	1.4F	UN 0427	Explosive (1.4F)	–	–	–	
N	Projectiles, *with burster or expelling charge*	1.4D	UN 0347	Explosive (1.4D)	–	–	–	

AVAILABLE

Optional Hazardous Materials Table—Continued

(1) Notes and Symbols	(2) Hazardous Materials Description and Proper Shipping Names	(3) IMO Class	(4) Identification Number	(5) Label(s) required	(6) Packaging Group	(7) Vessel Stowage Requirements		
						(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
N	Projectiles, *with bursting charge*	1.1D	UN 0168	Explosive (1.1D)	--	--	--	
N	Projectiles, *with bursting charge*	1.2D	UN 0169	Explosive (1.2D)	--	--	--	
N	Projectiles, *with bursting charge*	1.4D	UN 0344	Explosive (1.4D)	--	--	--	
N	Projectiles, *with bursting charge*	1.1F	UN 0167	Explosive (1.1F)	--	--	--	
N	Projectiles, *with bursting charge*	1.2F	UN 0324	Explosive (1.2F)	--	--	--	
	Propadiene, inhibited	2.1	UN 2200	Flammable Gas	--	1	5	
	Propane	2.1	UN 1978	Flammable Gas	--	1,2	1	
	Propanethiols	3.1	UN 2402	Flammable Liquid	II	1,3	5	Keep cool and dry. Stow 'away from' foodstuffs and all odor absorbing cargo
	Propanol	3.2	UN 1274	Flammable Liquid	II	1,2	1	
	Propionaldehyde	3.1	UN 1275	Flammable Liquid	II	1,3	5	Keep cool
		3.2	UN 1275	Flammable Liquid	II	1,2	1	
	Propionic acid, *solution containing not less than 80% acid*	8	UN 1848	Corrosive, Flammable Liquid (only if flashpoint 61 deg C or below)	III	1,2	1,2	Stow 'separated by a complete compartment or hold from' organic peroxides, and 'separated longitudinally by a complete compartment or hold from' explosives. If flashpoint is 61 deg C or below, segregation same as for flammable liquids
	Propionic anhydride	8	UN 2496	Corrosive	III	1,2	1,2	Keep dry. Glass carboys prohibited on passenger vessels
	Propionitrile	3.2	UN 2404	Flammable Liquid, Poison	II	1,3	5	Keep cool
	Propionyl chloride	3.2	UN 1815	Flammable Liquid, Corrosive	II	1,2	1	
	n-Propyl acetate	3.2	UN 1276	Flammable Liquid	II	1,2	1	
	sec-Propyl alcohol. *See* Isopropanol							
	n-Propyl alcohol. *See* Propanol							
	Propylamine. *See* Monopropylamine							
	Propyl benzene	3.3	UN 2364	Flammable Liquid	II	1,2	1,2	
	Propyl chloride	3.1	UN 1278	Flammable Liquid	II	1,3	5	Keep cool
	n-Propyl chloroformate	3.3	UN 2740	Flammable Liquid, Poison, Corrosive	I	1,2	1,2	
	Propylene	2.1	UN 1077	Flammable Gas	--	1,2	1	

	Propylene chlorohydrin	6.1	UN 2611	Poison, Flammable Liquid	II	1,3	1,3	Keep cool. Shade from radiant heat. Segregation same as for flammable liquids
	Propylenediamine	3.2 3.3	UN 2258 UN 2258	Flammable Liquid, Corrosive Flammable Liquid, Corrosive	II II	1,2 1,2	1,2 1,2	
	Propylene dichloride	3.2	UN 1279	Flammable Liquid	II	1,2	1	
	Propyleneimine, *inhibited*	3.2	UN 1921	Flammable Liquid	I	1,2	1	
	Propylene oxide	3.1	UN 1280	Flammable Liquid	I	1,3	5	Keep cool
	Propylene tetramer	3.3	UN 2850	Flammable Liquid	III	1,2	1,2	
	Propyl formates	3.2	UN 1281	Flammable Liquid	II	1,2	1	
	n-Propyl isocyanate	3.2	UN 2482	Flammable Liquid, Poison	I	1	5	Keep cool. Stow 'away from' living quarters and sources of heat
	n-Propyl nitrate	3.2	UN 1865	Flammable Liquid	II	1,2	1	
	Propyl trichlorosilane	8	UN 1816	Corrosive, Flammable Liquid	II	1	1	Keep dry. Stow 'separated longitudinally by an intervening compartment or hold from' explosives. Segregation same as for flammable liquids
	Pyridine	3.2	UN 1282	Flammable Liquid, Poison	II	1,2	1	
	Pyrophoric fuel, n.o.s. *See* Fuel, pyrophoric, n.o.s.							
	Pyrophoric liquids, n.o.s.	4.2	UN 2845	Spontaneously Combustible	I	1	5	Prohibited on any ship carrying explosives (except explosives in Division 1.4, Compatibility Group S)
	Pyrophoric metals, n.o.s. *or* Pyrophoric alloys, n.o.s.	4.2	UN 1383	Spontaneously Combustible	II	1	5	
	Pyrophoric solids, n.o.s.	4.2	UN 2846	Spontaneously Combustible	I/II/III	1	1	
	Pyrosulphuryl chloride	8	UN 1817	Corrosive	II	1	1	Keep dry. Glass carboys prohibited on passenger vessels
	Pyroxylin. *See* Nitrocellulose							
	Pyrrolidine	3.2	UN 1922	Flammable Liquid	II	1,2	1	
	Quinoline	6.1	UN 2656	St. Andrews Cross, Flammable Liquid (only if flashpoint below 61 deg C)	III	1,3	1,3	Keep cool. Shade from radiant heat. If flashpoint below 61 deg C, segregation same as for flammable liquids
	Rags, *oily*	4.2	UN 1856	Spontaneously Combustible	III	1,2	1,2	Keep dry
	Rare gases, *mixtures*	2.2	UN 1979	Nonflammable Gas	--	1,2	1,2	
	Rare gases, *mixtures with* nitrogen	2.2	UN 1981	Nonflammable Gas	--	1,2	1,2	
	Rare gases, *mixtures with* oxygen	2.2	UN 1980	Nonflammable Gas	--	1,2	1,2	
	Receptacles, *small, containing* flammable compressed gas, *not fitted with a dispersion device, not refillable*	2.1	UN 2037	Flammable Gas	--			
	Reducing liquid. *See* Flammable liquid preparation, n.o.s.							
N	Refrigerant gases, n.o.s.	2.1	UN 1078	Flammable Gas	--	1	1	
	Refrigerant gases, n.o.s.	2.2	UN 1078	Nonflammable Gas	--	1,2	1,2	

Optional Hazardous Materials Table—Continued

(1)	(2)	(3)	(4)	(5)	(6)	(7) Vessel Stowage Requirements		
Notes and Symbols	Hazardous Materials Description and Proper Shipping Names	IMO Class	Identification Number	Label(s) required	Packaging Group	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Refrigerating machines *containing non-flammable, non-toxic liquefied gases*	2.2	UN 2857	Nonflammable Gas	--	1,2	1,2	
	Release devices, explosive	1.4S	UN 0173	None. Package to be marked '1.4 S'	--	1,3	1,3	
	Removing liquid. *See* Flemmable liquid preparations, n.o.s.							
	Resin solution *in flammable liquid*	3.2	UN 1866	Flammable Liquid	II	1,2	1	
		3.3	UN 1866	Flammable Liquid	III	1,2	1,2	
	Resin solution, poisonous	6.1	UN 1896	Poison, Flammable Liquid (only if flashpoint between 23 and 61 deg C)	I/II	1,2	1,2	If flashpoint between 23 and 61 deg C, segregation same as for flammable liquids
			UN 1896	St. Andrews Cross, Flammable Liquid (only if flashpoint between 23 and and 61 deg C)	III	1,2	1,2	If flashpoint between 23 and 61 deg C, segregation same as for flammable liquids
	Resorcinol	6.1	UN 2876	St. Andrews Cross	III	1,2	1,2	
	Rivets, explosive	1.4 S	UN 0174	None. Package to be marked '1.4 S'	--	1,3	1,3	
	Road asphalt, *liquid, tars or oil. See* Cut-backs, *asphalt or bitumen*							
N	Rocket motors	1.1C	UN 0280	Explosive (1.1C)	--	--	--	
N	Rocket motors	1.2C	UN 0281	Explosive (1.2C)	--	--	--	
N	Rocket motors	1.3C	UN 0186	Explosive (1.3C)	--	--	--	
N	Rocket motors, *containing hypergolic liquids, with or without expelling charge*	1.2L	UN 0322	Explosive (1.2L)	--	--	--	
N	Rocket motors, *containing hypergolic liquids, with or without expelling charge*	1.3L	UN 0250	Explosive (1.3L)	--	--	--	
N	Rocket motors, liquid fueled	1.2J	UN 0395	Explosive (1.2J)	--	--	--	
N	Rocket motors, liquid fueled	1.3J	UN 0396	Explosive (1.3J)	--	--	--	
N	Rockets, line throwing	1.2G	UN 0238	Explosive (1.2G)	--	--	--	
N	Rockets, line throwing	1.3G	UN 0240	Explosive (1.3G)	--	--	--	
N	Rockets, liquid fueled, *with bursting charge*	1.1J	UN 0397	Explosive (1.1J)	--	--	--	
N	Rockets, liquid fueled, *with bursting charge*	1.2J	UN 0398	Explosive (1.2J)	--	--	--	
N	Rockets, *with bursting charge*	1.1E	UN 0181	Explosive (1.1E)	--	--	--	
N	Rockets, *with bursting charge*	1.2E	UN 0182	Explosive (1.2E)	--	--	--	

N	Rockets, *with bursting charge*	1.1F	UN 0180	Explosive (1.1F)	--	--	--	
N	Rockets, *with bursting charge*	1.2F	UN 0295	Explosive (1.2F)	--	--	--	
N	Rockets, *with inert head*	1.3C	UN 0183	Explosive (1.3C)	--	--	--	
	Rodenticides, n.o.s., *liquid*	6.1	UN 1681	Poison	I	1	1	
		6.1	UN 1681	Poison	II	1,2	1	
		6.1	UN 1681	St. Andrews Cross	III	1,2	1,2	
	Rodenticides, n.o.s., *solid*	6.1	UN 1681	Poison	I/II	1,2	1,2	
		6.1	UN 1681	St. Andrews Cross	III	1,2	1,2	
	Rosin oil	3.2	UN 1286	Flammable Liquid	III	1,2	1	
		3.3	UN 1286	Flammable Liquid	III	1,2	1,2	
	R 22. See Chlorodifluoromethane							
	R 12. See Dichlorodifluoromethane							
	Rubber scrap, *powdered or granulated*	4.1	UN 1345	Flammable Solid	II	1,2	1,2	
	Rubber shoddy. *See* Rubber scrap							
	Rubber solution	3.2	UN 1287	Flammable Liquid	II	1,2	1	
		3.3	UN 1287	Flammable Liquid	II	1,2	1,2	
	Rubidium hydroxide, solid	8	UN 2678	Corrosive	II	1,2	1,2	Keep dry
	Rubidium hydroxide, solution	8	UN 2677	Corrosive	II	1,2	1,2	
	Rubidium, *metal*	4.3	UN 1423	Dangerous When Wet	I	1,2	5	
N	Samples, explosive, *other than initiating explosive*	1	UN 0190	As directed by the competent authority	--	--	--	
	Sand acid. *See* Fluosilicic acid							
	Seed cake, *containing vegetable oil, mechanically expelled seeds, containing more than 10% of oil or more than 20% of oil and moisture combined*	4.2	UN 1386	None. Package to be marked 'Class 4.2'	III	1,2	5	
	Seed cake, *containing vegetable oil, solvent extractions and expelled seeds, containing not more than 10% of oil and, when the amount of moisture is higher than 10%, not more than 20% of oil and moisture combined*	4.2	UN 1386	None. Package to be marked 'Class 4.2'	III	1,2	1,2	
	Seed cake, *containing vegetable oil, solvent extractions containing not more than 1.5% of oil and 11% of moisture*	4.2	UN 2217	None. Package to be marked 'Class 4.2'	III	1,2	1,2	
	Selenates, n.o.s. *or* Selenites, n.o.s	6.1	UN 2630	Poison	I	1,2	5	Stow 'away from' living quarters
	Selenic acid	8	UN 1905	Corrosive	I	1,2	1,2	Keep dry
	Selenium disulphide	6.1	UN 2657	Poison	II	1,2	1,2	Stow 'away from' living quarters
	Selenium hexafluoride	2.3	UN 2194	Poison Gas	--	1	5	Stow 'away from' living quarters
	Selenium *metal powder, non-pyrophoric*	6.1	UN 2658	St. Andrews Cross	III	1,2	1,2	
	Selenium oxychloride	8	UN 2879	Corrosive, Poison	I	1,2	5	Keep dry
	Shale oil	3.2	UN 1288	Flammable Liquid	II	1,2	1	
		3.3	UN 1288	Flammable Liquid	II	1,2	1,2	
	Shellac. *See* Paints, *etc.*							
	Signal devices, hand	1.4S	UN 0373	None. Package to be marked '1.4S'	--	1,3	1,3	
	Signal devices, hand	1.4 G	UN 0191	Explosive (1.4G)	--	1,3	1,3	
N	Signals, distress, *ship (other than water-activated)*	1.1G	UN 0194	Explosive (1.1G)	--	--	--	

Optional Hazardous Materials Table—Continued

(1)	(2)	(3)	(4)	(5)	(6)	(7) Vessel Stowage Requirements		
Notes and Symbols	Hazardous Materials Description and Proper Shipping Names	IMO Class	Identification Number	Label(s) required	Packaging Group	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
N	Signals, distress, *ship (other than water-activated)*	1.3G	UN 0195	Explosive (1.3G)	--	--	--	
N	Signals, railway track, explosive	1.1G	UN 0192	Explosive (1.1G)	--	--	--	
N	Signals, railway track, explosive	1.4S	UN 0193	None. Package to be marked '1.4S'	--	--	--	
N	Signals, smoke, *with explosive sound unit*	1.1G	UN 0196	Explosive (1.1G)	--	--	--	
N	Signals, smoke, *with explosive sound unit*	1.2G	UN 0313	Explosive (1.2G)	--	--	--	
	Signals, smoke, *without explosive sound unit*	1.4 G	UN 0197	Explosive (1.4G)	--	1,3	1,3	
	Silane	2.1	UN 2203	Flammable Gas	--	1	5	Shade from radiant heat. Stow 'separated from' oxidizing substances such as bromine and chlorine
	Silicofluoric acid. *See* Fluosilicic acid							
	Silicofluorides, n.o.s.	6.1	UN 2856	St. Andrews Cross	III	1,2	1,2	Stow 'away from' acids
	Silicon chloride. *See* Silicon tetrachloride							
	Silicon powder, *amorphous*	4.1	UN 1346	Flammable Solid	III	1,2	1,2	
	Silicon tetrachloride	8	UN 1818	Corrosive	II	1	1	Keep dry. Glass carboys prohibited on passenger vessels
	Silicon tetrafluoride	2.3	UN 1859	Poison Gas, Corrosive	--	1	5	
	Silver arsenite	6.1	UN 1683	Poison	II	1,2	1,2	
	Silver cyanide	6.1	UN 1684	Poison	II	1,2	1,2	Stow 'away from' strong liquid acids
	Silver nitrate	5.1	UN 1493	Oxidizer	II	1,2	1,2	Stow 'away from' foodstuffs
	Silver picrate, wetted *with, by weight, at least 30% water*	4.1	UN 1347	Flammable Solid	I	1	5	
	Sisal, dry. See Fibre, *vegetable, dry*							
	Sludge acid	8	UN 1906	Corrosive	II	1,2	1	Stow 'away from' fluorides. Metal drums only under deck
	Soda lime	8	UN 1907	Corrosive	III	1,2	1,2	Keep dry
	Sodium aluminate, solution	8	UN 1819	Corrosive	II	1,2	1,2	
	Sodium aluminium hydride	4.3	UN 2835	Dangerous When Wet	II	1,2	5	
	Sodium amalgam	4.3	UN 1424	Dangerous When Wet	I	1,2	1,2	
	Sodium amide	4.3	UN 1425	Dangerous When Wet	II	1,2	5	
	Sodium ammonium vanadate	6.1	UN 2863	Poison	II	1,2	1,2	Stow 'away from' living quarters
	Sodium arsanilate	6.1	UN 2473	St. Andrews Cross	III	1,2	1,2	
	Sodium arsenate	6.1	UN 1685	Poison	II	1,2	1,2	
	Sodium arsenite, aqueous solutions	6.1 6.1	UN 1686 UN 1686	Poison St. Andrews Cross	I/II III	1,2 1,2	1,2 1,2	

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	Sodium arsenite, solid	6.1	UN 2027	Poison	II	1,2	1,2	
	Sodium azide	6.1	UN 1687	Poison	II	1,2	1,2	Stow 'away from' heavy metals and their compounds, 'seperated from' acids
	Sodium bisulphate, solid. *See* Sodium hydrogen sulphate, solid							
	Sodium bisulphite, solution. *See* Sodium hydrogen sulphite, solution							
	Sodium borohydride	4.3	UN 1426	Dangerous When Wet	I	1,2	5	
	Sodium bromate	5.1	UN 1494	Oxidizer	II	1,2	1,2	Stow 'away from' powdered metals, 'separated from' ammonium compounds
	Sodium cacodylate	6.1	UN 1688	Poison	II	1,2	1,2	Stow 'away from' acids
	Sodium chlorate	5.1	UN 1495	Oxidizer	II	1,2	1,2	Stow 'away from' powdered metals, 'separated from' ammonium compounds
	Sodium chlorate, *aqueous* solution	5.1	UN 2428	Oxidizer	II	1,2	1	Stow 'away from' powdered metals and 'separated from' ammonium compounds
	Sodium chlorite	5.1	UN 1496	Oxidizer	II	1,2	1,2	Stow 'away from' powdered metals, 'separated from' ammonium compounds
	Sodium chlorite, solution *with more than 5% available chlorine*	8	UN 1908	Corrosive	II	1,2	1	Glass carboys in hampers not permitted under deck
	Sodium chloroacetate	6.1	UN 2659	St. Andrews Cross	III	1,3	1,3	Keep cool and dry
	Sodium cuprocyanide, *solid*	6.1	UN 2316	Poison	I	1,2	1,2	Keep dry. Stow 'separated from' acids
	Sodium cuprocyanide solution	6.1	UN 2317	Poison	I	1,2	1	Stow 'away from' living quarters and 'separated from' acids
	Sodium cyanide	6.1	UN 1689	Poison	I	1,2	1,2	Stow 'away from' acids
N	Sodium dinitro-o-cresolate, *dry or wetted with less than 15% water, by weight*	1.3C	UN 0234	Explosive (1.3C)	--	--	--	
	Sodium dinitro-o-cresolate, wetted *with, by weight, at least 15% water*	4.1	UN 1348	Flammable Solid, Poison	I	1,2	5	Stow 'away from' heavy metals and their compounds
	Sodium dinitro-o-cresolate, wetted *with, by weight, at least 10% water*	4.1	UN 1348	Flammable Solid, Poison	I	1	5	Stow 'away from' heavy metals and their compounds
	Sodium dithionite	4.2	UN 1384	Spontaneously Combustible	II	1,2	1,2	Keep dry. Only metal drums permitted on passenger vessels
	Sodium fluoride, solid	6.1	UN 1690	St. Andrews Cross	III	1,2	1,2	Stow 'away from' acids
	Sodium fluoride, solution	6.1	UN 1690	St. Andrews Cross	III	1,2	1,2	
	Sodium fluoroacetate	6.1	UN 2629	Poison	I	1,2	5	Stow 'away from' living quarters
	Sodium hydrate. *See* Sodium hydroxide, *solution*							
	Sodium hydride	4.3	UN 1427	Dangerous When Wet	I	1,2	5	
	Sodium hydrogen fluoride	8	UN 2439	Corrosive	II	1,3	1,3	Keep cool and dry
	Sodium hydrogen sulphate, solid	8	UN 1821	Corrosive	II	1,2	1,2	
	Sodium hydrogen sulphate, solution	8	UN 2837	Corrosive	II	1,2	1,2	
	Sodium hydrogen sulphite, solution. *See* Bisulphites, inorganic, aqueous solutions, n.o.s.							
	Sodium hydrosulphide, *with less than 25% water of crystallization*	4.2	UN 2318	Spontaneously Combustible	II	1,2	1,2	
	Sodium hydrosulphide, *with not less than 25% water of crystallization*	8	UN 2949	Corrosive	II	1,2	1,2	Keep dry. Stow 'away from' acids
	Sodium hydrosulphide, *with not less than 25% water of crystallization*	8	UN 2949	Corrosive	II	1,2	1,2	
	Sodium hydrosulphite. *See* Sodium dithionite							
	Sodium hydroxide, solid	8	UN 1823	Corrosive	II	1,2	1,2	Keep dry

Optional Hazardous Materials Table—Continued

(1)	(2)	(3)	(4)	(5)	(6)	(7) Vessel Stowage Requirements		
Notes and Symbols	Hazardous Materials Description and Proper Shipping Names	IMO Class	Identification Number	Label(s) required	Packaging Group	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Sodium hydroxide, solution	8	UN 1824	Corrosive	II	1,2	1,2	
	Sodium, *metal*	4.3	UN 1428	Dangerous When Wet	II	1,2	5	
	Sodium *metal, dispersion in organic liquids*	4.3	UN 1429	Dangerous When Wet	I	1,2	5	
	Sodium methylate	4.3	UN 1431	Dangerous When Wet	I	1,2	1	
	Sodium methylate, solutions *in alcohol*	3.2	UN 1289	Flammable Liquid	II	1,2	1	
		3.3	UN 1289	Flammable Liquid	II	1,2	1,2	
	Sodium monoxide	8	UN 1825	Corrosive	II	1,2	1,2	Keep dry
	Sodium nitrate	5.1	UN 1498	Oxidizer	III	1,2	1,2	
	Sodium nitrate and potash, mixtures	5.1	UN 1478	Oxidizer	II	1,2	1,2	
	Sodium nitrate and potassium nitrate, *mixtures*	5.1	UN 1499	Oxidizer	III	1,2	1,2	
	Sodium nitrate bags, *empty. See* Bags, *empty and unwashed, etc.*							
	Sodium nitrite	5.1	UN 1500	Oxidizer	III	1,2	1,2	Stow 'separated from' ammonium compounds and cyanides and 'away from' foodstuffs
	Sodium pentachlorophenate	6.1	UN 2567	Poison	II	1,2	1,2	Stow 'away from' living quarters
	Sodium percarbonates	5.1	UN 2467	Oxidizer	III	1,2	1,2	Keep dry
	Sodium perchlorate	5.1	UN 1502	Oxidizer	II	1,2	1,2	Stow 'away from' powdered metals
	Sodium germanganate	5.1	UN 1503	Oxidizer	II	1,2	1,2	Stow 'separated from' ammonium compounds and hydrogen peroxide
	Sodium peroxide	5.1	UN 1504	Oxidizer	I	1,2	1	Keep dry. Stow 'away from' powdered metals, permanganates, and combustible packagings and cargo
	Sodium persulphate	5.1	UN 1505	Oxidizer	III	1,2	1,2	
	Sodium phenolate, solid	8	UN 2497	Corrosive	III	1,2	1,2	
	Sodium phosphide	4.3	UN 1432	Dangerous When Wet, Poison	I	1,2	5	When stowed under deck, stow in a mechanically ventilated space
N	Sodium picramate, *dry or wetted with less than 20% water, by weight*	1.3C	UN 0235	Explosive (1.3C)	--	--	--	
	Sodium picramate, wetted *with, by weight, at least 20% water*	4.1	UN 1349	Flammable Solid	I	1,2	5	Stow 'away from' heavy metals and their compounds
	Sodium-potassium, *alloy. See* Potassium-sodium, *alloy*							
N	Sodium salts of nitro-aromatic derivatives, n.o.s., *explosive*	1.3C	UN 0203	Explosive (1.3C)	--	--	--	
	Sodium silicofluoride	6.1	UN 2674	St. Andrews Cross	III	1,2	1,2	Stow 'away from' acids
	Sodium sulphide, anhydrous *or* Sodium sulphide *with less than 30% water of crystallization*	4.2	UN 1385	Spontaneously Combustible	II	1,2	1,2	Stow 'separated from' liquid acids

	Sodium sulphide, hydrated, *with at least 30% water*	8	UN 1849	Corrosive	II	1,2	1,2	Stow 'away from' acids
	Sodium superoxide	5.1	UN 2547	Oxidizer	I	1,2	5	Keep dry. Stow 'away from' powdered metals, permanganates and combustible packaging and cargo
N	Sounding devices, explosive	1.1E	UN 0374	Explosive (1.1E)	--	--	--	
N	Sounding devices, explosive	1.2E	UN 0375	Explosive (1.2E)	--	--	--	
N	Sounding devices, explosive	1.1F	UN 0296	Explosive (1.1F)	--	--	--	
N	Sounding devices, explosive	1.2F	UN 0204	Explosive (1.2F)	--	--	--	
	Spent mixed acid. See Acid mixtures, *spent*							
	Spirits of salts. *See* Hydrochloric acid							
	Squibs	1.4S	UN 0206	None. Package to be marked '1.4S'	--	1,3	1,3	
	Squibs	1.4B	UN 0422	Explosive (1.4B)	--	1,3	5	
	Squibs	1.4G	UN 0423	Explosive (1.4G)	--	1,3	5	
	Stains. *See* Paints, *etc.*							
	Stannic chloride, anhydrous	8	UN 1827	Corrosive	II	1	1	Keep dry. Glass carboys prohibited on passenger vessels
	Stannic chloride pentahydrate	8	UN 2440	Corrosive	III	1,2	1,2	Keep dry
	Stannic phosphides	4.3	UN 1433	Dangerous When Wet	I	1,2	5	When stowed under deck, stow in a mechanically ventilated space
	Stibine	2.3	UN 2676	Poison Gas, Flammable Gas	--	1	5	Stow 'away from' living quarters
	Straw	4.1	UN 1327	None	III	1,2	1,2	Stow 'away from' animal or vegetable oils
	Strike anywhere matches. *See* Matches, *strike anywhere*							
	Strontium, *alloys, non-pyrophoric*	4.3	UN 1434	Dangerous When Wet	II	1,2	5	
	Strontium arsenite	6.1	UN 1691	Poison	II	1,2	1,2	
	Strontium chlorate	5.1	UN 1506	Oxidizer	II	1,2	1,2	Stow 'away from' powdered metals, 'separated from' ammonium compounds
	Strontium nitrate	5.1	UN 1507	Oxidizer	III	1,2	1,2	
	Strontium perchlorate	5.1	UN 1508	Oxidizer	II	1,2	1,2	Stow 'away from' powdered metals
	Strontium peroxide	5.1	UN 1509	Oxidizer	II	1,2	1,2	Keep dry
	Strontium phosphide	4.3	UN 2013	Dangerous When Wet, Poison	I	1,2	5	When stowed under deck, stow in a mechanically ventilated space
	Strychnine *(and salts of), liquid*	6.1	UN 1692	Poison	I	1		
		6.1	UN 1692	Poison	II	1,2		
		6.1	UN 1692	St. Andrews Cross	III	1,2		
							1 1,2	
	Strychnine *(and salts of), solid*	6.1	UN 1692	Poison	I/II	1,2	1,2	
		6.1	UN 1692	St. Andrews Cross	III	1,2	1,2	
	Styrene monomer, inhibited	3.3	UN 2055	Flammable Liquid	II	1,2	1,2	
N	Substances, explosive, n.o.s.	1.1L	UN 0357	Explosive (1.1L)	--	--	--	
N	Substances, explosive, n.o.s.	1.2L	UN 0358	Explosive (1.2L)	--	--	--	
N	Substances, explosive, n.o.s.	1.3L	UN 0359	Explosive (1.3L)	--	--	--	

Optional Hazardous Materials Table—Continued

(1) Notes and Symbols	(2) Hazardous Materials Description and Proper Shipping Names	(3) IMO Class	(4) Identification Number	(5) Label(s) required	(6) Packaging Group	(7) Vessel Stowage Requirements (a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Substances which, in contact with water, emit flammable gases, n.o.s.	4.3	UN 2813	Dangerous When Wet	I/II/III	1,2	5	
	Substituted nitrophenol pesticides, liquid, flammable, toxic, n.o.s., *flashpoint below 23 deg C*	3.2	UN 2780	Flammable Liquid and Poison or St. Andrews Cross (according to toxicity)	I/II	1,2	1	
	Substituted nitrophenol pesticides, liquid, toxic, flammable, n.o.s., *flashpoint between 23 deg C and 61 deg C*	6.1	UN 3013	Poison, Flammable Liquid	I	1	1	Segregation same as for flammable liquids
		6.1	UN 3013	Poison, Flammable Liquid	II	1,2	1	Segregation same as for flammable liquids
		6.1	UN 3013	St. Andrews Cross, Flammable Liquid	III	1,2	1,2	Segregation same as for flammable liquids
	Substituted nitrophenol pesticides, liquid, toxic, n.o.s.	6.1	UN 3014	Poison	I	1	1	
		6.1	UN 3014	Poison	II	1,2	1	
		6.1	UN 3014	St. Andrews Cross	III	1,2	1,2	
	Substituted nitrophenol pesticides, solid, toxic, n.o.s.	6.1	UN 2779	Poison	I/II	1,2	1,2	
		6.1	UN 2779	St. Andrews Cross	III	1,2	1,2	
	Succinic acid peroxide. *See* Disuccinic acid peroxide				--	--	--	
	Sulphamic acid	8	UN 2967	Corrosive	III	1,2	1,2	
	Sulphur chlorides	8	UN 1828	Corrosive	I	1	1	Keep dry. Glass carboys prohibited on passenger vessels
	Sulphur dichloride. See Sulphur chlorides							
	Sulphur dioxide, *liquefied*	2.3	UN 1079	Poison Gas	--	1,2	5	Stow 'away from' living quarters
	Sulphur hexafluoride	2.2	UN 1080	Nonflammable Gas	--	1,2	1,2	
	Sulphuric acid, fuming	8	UN 1831	Corrosive, Poison	I	1,2	1	Keep dry. Stow 'away from' fluorides and all other corrosives except nitric acids and sulphur trioxide. Under deck stowage is permitted in metal drums only
	Sulphuric acid, spent	8	UN 1832	Corrosive	II	1,2	1	Stow 'away from' fluorides. For concentrations of more than 51% acid, stow 'away from' all other corrosives except nitric acids and sulphur trioxide. Under deck stowage is permitted in metal drums only.

Sulphuric acid, *with more than 51% acid*	8	UN 1830	Corrosive	II	1,2	1	Stow 'away from' fluorides and all other corrosive except nitric acids and sulpher trioxide. Under deck stowage is permitted in metal drums only
Sulphuric acid, *with not more than 51% acid*	8	UN 2796	Corrosive	II	1,2	1	Stow 'away from' fluorides. Glass carboys in hampers not permitted under deck
Sulphuric and hydrofluoric acid, mixtures. See Hydrofluoric acid and sulphuric acid mixtures							
Sulphuric anhydride. *See* Sulphur trioxide, *stabilized*							
Sulphur, *lump and coarse grained powder, or fine grained powder*	4.1	UN 1350	Flammable Solid	III	1,2	1,2	Protect from sparks and open flame. Stow 'separated from' oxidizing substances
Sulphur, molten	4.1	UN 2448	Flammable Solid	III	1	1	Stow 'separated from' oxidizers, 'away from' living quarters
Sulphurous acid	8	UN 1833	Corrosive	II	1,2	1	Glass carboys in hampers not permitted under deck
Sulphur tetrafluoride	2.3	UN 2418	Poison Gas	--	1	5	Stow 'away from' living quarters
Sulphur trioxide, *stabilized*	8	UN 1829	Corrosive	I	1,2	1,2	Keep dry. Glass bottles not permitted under deck. Stow 'away from' other corrosives except nitric and sulphuric acids
Sulphuryl chloride	8	UN 1834	Corrosive	I	1	1	Keep dry. Glass carboys prohibited on passenger vessels
Sulphuryl fluoride	2.3	UN 2191	Poison Gas	--	1,2	5	Stow 'away from' living quarters
Tars, *liquid. See* Cut-backs, *asphalt or bitumen*							
Tear gas candles, *non-explosive*	6.1	UN 1700	Poison, Flammable Solid	II	1	5	Segregation same as for flammable solids. Stow 'away from' living quarters
Tear gas grenades, *non-explosive. See* Tear gas candles							
Tear gas, *(irritating substances, liquid or solid)*, n.o.s.	6.1	UN 1693	Poison	I/II	1	5	
	6.1	UN 1693	St. Andrews Cross	III	1	5	
Tellurium hexafluoride	2.3	UN 2195	Poison Gas	--	1	5	Stow 'away from' living quarters
T.E.L. See Motor fuel anti-knock mixtures							
Terpene hydrocarbons n.o.s.	3.3	UN 2319	Flammable Liquid	III	1,2	1,2	
Terpinolene	3.3	UN 2541	Flammable Liquid	III	1,2	1,2	
Tetrabromoethane	6.1	UN 2504	St. Andrews Cross	III	1,2	1,2	
1,1,2,2-Tetrachloroethane	6.1	UN 1702	Poison	II	1,2	1,2	
Tetrachloroethylene	6.1	UN 1897	St. Andrews Cross	III	1,2	1,2	
Tetraethyl dithiopyrophosphate, liquid *or* mixtures	6.1	UN 1704	Poison	I/II	1	5	
	6.1	UN 1704	St. Andrews Cross	III	1	5	
Tetraethyl dithiopyrophosphate with gases, *including solutions and mixtures thereof*	2.3	UN 1703	Poison Gas	--	1	5	Stow 'away from' living quarters
Tetraethylenepentamine	8	UN 2320	Corrosive	III	1,2	1,2	Glass carboys prohibited on passenger vessels
Tetraethyl lead. *See* Motor fuel anti-knock mixtures							
Tetraethyl pyrophosphate and compressed gas, *mixture*	2.3	UN 1705	Poison Gas	--	1	5	Stow 'away from' living quarters
Tetraethyl silicate	3.3	UN 1292	Flammable Liquid	II	1,2	1,2	
Tetrafluoroethylene, inhibited	2.1	UN 1081	Nonflammable Gas	--	1,2	5	

Optional Hazardous Materials Table—Continued

(1) Notes and Symbols	(2) Hazardous Materials Description and Proper Shipping Names	(3) IMO Class	(4) Identification Number	(5) Label(s) required	(6) Packaging Group	(7) Vessel Stowage Requirements (a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Tetrafluorohydrazine	2.3	(UN 1955)	Poison Gas	--	1	5	Stow 'away from' living quarters and readily combustible substances, 'separated from' hydrogen
	Tetrafluoromethane	2.2	UN 1982	Nonflammable Gas	--	1,2	1,2	
	1,2,3,6-Tetrahydrobenzaldehyde	3.3	UN 2498	Flammable Liquid	III	1,2	1,2	
	Tetrahydrofuran	3.1	UN 2056	Flammable Liquid	II	1,3	5	Keep cool
	Tetrahydrofurfurylamine	3.3	UN 2943	Flammable Liquid	III	1,2	1,2	
	Tetrahydrophthalic anhydrides	8	UN 2698	None. Package to be as marked 'Class 8'	III	1,2	1,2	Keep dry
	1,2,3,6-Tetrahydropyridine	3.2	UN 2410	Flammable Liquid	II	1,2	1	
	Tetrahydrothiophene	3.2	UN 2412	Flammable Liquid	II	1,2	1	
	Tetralin hydroperoxide, *technical pure*	5.2	UN 2136	Organic Peroxide	I	1	5	
	Tetramethylammonium hydroxide	8	UN 1835	Corrosive	II	1,2	1,2	
	1,1,3,3-Tetramethyl butyl hydroperoxide, *technical pure*	5.2	UN 2160	Organic Peroxide	II	1	5	
	1,1,3,3-Tetramethyl butyl peroxy-2-ethyl hexanoate, *technical pure*	5.2	UN 2161	Organic Peroxide	I	1	5	Control temperature 20 deg C. Emergency temperature 25 deg C
	Tetramethylsilane	3.1	UN 2749	Flammable Liquid	I	1	5	Keep cool. Shade from radiant heat
N	Tetranitro-aniline	1.1D	UN 0207	Explosive (1.1D)	--	--	--	
	Tetranitromethane	5.1	UN 1510	Oxidizer	I	1	5	
	Tetrapropylorthotitanate	3.3	UN 2413	Flammable Liquid	II	1,2	1,2	
N	Tetrazol-1-acetic acid	1.4C	UN 0407	Explosive (1.4C)	--	--	--	
	Textile waste, wet, n.o.s.	4.2	UN 1857	Spontaneously Combustible	III	1,2	1,2	
	Thallium chlorate	5.1	UN 2573	Oxidizer, Poison	II	1,2	1,2	Stow 'separated from' ammonium compounds and foodstuffs and 'away from' finely powdered metals
	Thallium compounds, n.o.s. *liquid*	6.1	UN 1707	Poison	I	1		
		6.1	UN 1707	Poison	II	1,2	1	
		6.1	UN 1707	St. Andrews Cross	III	1,2	1,2	
	Thallium compounds, n.o.s. *solid*	6.1	UN 1707	Poison	I/II	1,2	1,2	
		6.1	UN 1707	St. Andrews Cross	III	1,2	1,2	

	Thallium nitrate	6.1	UN 2727	Poison	II	1,2	1,2	Stow 'away from' living quarters
	4-Thiapentanal	6.1	UN 2785	St. Andrews Cross, Flammable Liquid (only if flashpoint below 61 deg C)	III	1	5	Segregation same as for flammable liquids if flashpoint below 61 deg C. Shade from radiant heat and sunlight. Stow 'away from' living quarters, acids and bases
	Thinners. *See* Paints, *etc.*							
	Thinning liquid. *See* Flammable liquid preparations, n.o.s.							
	Thioacetic acid	3.2	UN 2436	Flammable Liquid	II	1,2	1	
	Thiocarbonyl chloride. See Thiophosgene							
	Thioglycol	6.1	UN 2966	Poison	II	1,2	1,2	
	Thioglycolic acid	8	UN 1940	Corrosive	II	1,2	1,2	Glass carboys in hampers prohibited under deck
	Thiolactic acid	6.1	UN 2936	Poison	II	1,2	1,2	
	Thionyl chloride	8	UN 1836	Corrosive	I	1	1	Keep dry. Glass carboys prohibited on passenger vessels
	Thiophene	3.2	UN 2414	Flammable Liquid	II	1,2	1	
	Thiophosgene	6.1	UN 2474	Poison	II	1,2	1	Stow 'away from' acids and living quarters
	Thiophosphoryl chloride	8	UN 1837	Corrosive	II	1	1	Keep dry. Glass carboys prohibited on passenger vessels
	Thiourea	6.1	UN 2877	St. Andrews Cross	III	1,2	1,2	
	Tin chloride, *fuming. See* Stannic chloride, anhydrous							
	Tinctures, medicinal	3.2 3.3	UN 1293 UN 1293	Flammable Liquid Flammable Liquid	II II	1,2 1,2	1 1,2	
	Tin tetrachloride. *See* Stannic chloride, anhydrous							
	Titanium hydride	4.1	UN 1871	Flammable Solid	II	1,2	5	
	Titanium *metal* powder, dry *mechanically produced, particle size between 3 and 53 microns; or chemically produced, particle size less than 840 microns*	4.2	UN 2546	Spontaneously Combustible	II	1	5	
	Titanium *metal* powder, wetted *with not less than 25% water (a visible excess of water must be present) mechanically produced, particle size between 3 and 53 microns; or chemically produced, particle size less than 840 microns*	4.1	UN 1352	Flammable Solid	II	1,2	5	
	Titanium sponge granules *or* Titanium sponge powders	4.1	UN 2878	Flammable Solid	III	1	5	
	Titanium tetrachloride	8	UN 1838	Corrosive	II	1	1	Keep dry. Glass carboys prohibited on passenger vessels
	Titanium trichloride mixtures, *non-pyrophoric*	8	UN 2869	Corrosive	II	1,2	1,2	Keep dry
	Titanium trichloride, pyrophoric *or* Titanium trichloride mixtures, pyrophoric	4.2	UN 2441	Spontaneously Combustible, Corrosive	II	1,2	1,2	
	Toe puffs, *nitrocellulose base*	4.1	UN 1353	Flammable Solid	III	1	5	
	Toluene	3.2	UN 1294	Flammable Liquid	II	1,2	1	
	Toluene diisocyanate *(T.D.I.)*	6.1	UN 2078	Poison	II	1,2	1	Shade from radiant heat. Stow 'away from' living quarters
	Toluidines *(o-, m-, p-)*	6.1	UN 1708	Poison	II	1,2	1,2	Stow 'away from' acids
	2,4-Toluylenediamine	6.1	UN 1709	St. Andrews Cross	III	1,2	1,2	
N	Torpedoes, *with bursting charge*	1.1E	UN 0329	Explosive (1.1E)	--	--	--	

Optional Hazardous Materials Table—Continued

(1) Notes and Symbols	(2) Hazardous Materials Description and Proper Shipping Names	(3) IMO Class	(4) Identification Number	(5) Label(s) required	(6) Packaging Group	(7) Vessel Stowage Requirements (a) Cargo vessel	(7) (b) Passenger vessel	(7) (c) Other requirements
N	Torpedoes, *with bursting charge*	1.1F	UN 0330	Explosive (1.1F)	--	--	--	
	Tracers for ammunition	1.4 G	UN 0306	Explosive (1.4G)	--	1,3	1,3	
N	Tracers for ammunition	1.3G	UN 0212	Explosive (1.3G)	--	--	--	
	Triallylamine	3.3	UN 2610	Flammable Liquid	II	1,2	1,2	
	Triallyl borate	6.1	UN 2609	St. Andrews Cross, Flammable Liquid (only if flashpoint below 61 deg C)	III	1,3	1,3	Keep cool and dry. Shade from radiant heat. If flashpoint below 61 deg C, segregation same as for flammable liquids
	Triazine pesticides, liquid, flammable, toxic, n.o.s., *flashpoint below 23 deg C*	3.2	UN 2764	Flammable Liquid and Poison or St. Andrews Cross (according to toxicity)	I/II	1,2	1	
	Triazine pesticides, liquid, toxic, flammable, n.o.s., *flashpoint between 23 deg C and 61 deg C*	6.1	UN 2997	Poison, Flammable Liquid	I	1	1	Segregation same as for flammable liquids
		6.1	UN 2997	Poison, Flammable Liquid	II	1,2	1	Segregation same as for flammable liquids
		6.1	UN 2997	St. Andrews Cross, Flammable Liquid	III	1,2	1,2	Segregation same as for flammable liquids
	Triazine pesticides, liquid, toxic, n.o.s.	6.1	UN 2998	Poison	I	1	1	
		6.1	UN 2998	Poison	II	1,2	1	
		6.1	UN 2998	St. Andrews Cross	III	1,2	1,2	
	Triazine pesticides, solid, toxic, n.o.s.	6.1	UN 2763	Poison	I/II	1,2	1,2	
		6.1	UN 2763	St. Andrews Cross	III	1,2	1,2	
	Tributylamine	8	UN 2542	Corrosive	III	1,2	1,2	
	Trichloroacetic acid, solid	8	UN 1839	Corrosive	II	1,2	1,2	Keep dry
	Trichloroacetic acid, *solutions*	8	UN 2564	Corrosive	II	1,2	1	Glass carboys in hampers prohibited under deck
	Trichloroacetyl chloride	8	UN 2442	Corrosive	II	1	5	Keep dry
	Trichlorobenzenes, *liquid*	6.1	UN 2321	St. Andrews Cross	III	1,2	1,2	Stow 'away from' living quarters
	Trichlorobutene	6.1	UN 2322	Poison	II	1,2	1,2	Shade from radiant heat. Stow 'away from' living quarters
	1,1,1-Trichloroethane	6.1	UN 2831	St. Andrews Cross	III	1,2	1,2	
	Trichloroethylene	6.1	UN 1710	St. Andrews Cross	III	1,2	1,2	

Trichloroisocyanuric acid, dry	5.1	UN 2468	Oxidizer	II	1,2	1,2	Shade from radiant heat. Keep dry. Stow 'separated from' nitrogen compounds
Trichlorosilane	4.3	UN 1295	Dangerous When Wet, Flammable Liquid, Corrosive	I	1	5	
Tricresylphosphate, *with more than 3% ortho isomer*	6.1	UN 2574	Poison	II	1,2	1,2	
Triethylaluminium	4.2	UN 1102	Spontaneously Combustible	I	1	1	
Triethylamine	3.2	UN 1296	Flammable Liquid	II	1,2	1	
Triethylenetetramine	8	UN 2259	Corrosive	II	1,2	1	Stow 'separated from' nitric acid, 'away from' acids, copper and copper alloys and living quarters
Triethyl phosphite	3.3	UN 2323	Flammable Liquid	III	1,2	1,2	Stow 'separated from' acids
Trifluoroacetic acid	8	UN 2699	Corrosive	I	1,3	1	Keep cool. Stow 'away from' all other corrosives
Trifluorobromomethane. See Bromotrifluoromethane							
Trifluorochloroethane. See Chlorotrifluoroethane							
Trifluorochloroethylene, inhibited	2.1	UN 1082	Flammable Gas	--	1,2	1	
Trifluorochloromethane. See Chlorotrifluoromethane							
Trifluoroethane	2.1	UN 2035	Flammable Gas	--	1,2	1	Stow 'away from' living quarters
Trifluoromethane	2.2	UN 1984	Nonflammable Gas	--	1,2	1,2	
3-Trifluoromethyl aniline	6.1	UN 2948	Poison	II	1,2	1,2	
2-Trifluoromethyl aniline	6.1	UN 2942	St. Andrews Cross	III	1,2	1,2	
Triisobutyl aluminium	4.2	UN 1930	Spontaneously Combustible	I	1	1	
Triisobutylene	3.3	UN 2324	Flammable Liquid	II	1,2	1,2	
Triisocyanatoisocyanurate of isophoronediisocyanate, solution 70%, *by weight*	3.3	UN 2906	Flammable Liquid	III	1,2	1,2	
Triisopropyl borate	3.3	UN 2616	Flammable Liquid	II	1,2	1,2	
Trimethylacetyl chloride	8	UN 2438	Corrosive, Flammable Liquid	II	1	5	Shade from radiant heat. Segregation same as for flammable liquids
Trimethylaluminium	4.2	UN 1103	Spontaneously Combustible	I	1	1	
Trimethylamine, anhydrous	2.1	UN 1083	Flammable Gas	--	1	5	
Trimethylamine, *aqueous solutions containing not more than 30% of trimethylamine*	3.2	UN 1297	Flammable Liquid	II	1,2	1	Stow 'away from' mercury and its compounds
1,3,5-Trimethylbenzene	3.3	UN 2325	Flammable Liquid	III	1,2	1,2	
Trimethyl borate	3.2	UN 2416	Flammable Liquid	II	1,2	1	
	3.3	UN 2416	Flammable Liquid	II	1,2	1,2	
Trimethylchlorosilane	3.2	UN 1298	Flammable Liquid, Corrosive	I	1,2	1	
Trimethylcyclohexylamine	8	UN 2326	Corrosive	III	1,2	1,2	Glass carboys prohibited on passenger vessels
Trimethylhexamethylene diamines	8	UN 2327	Corrosive	III	1,2	1,2	Glass carboys prohibited on passenger vessels
Trimethylhexamethylene diisocyanate	6.1	UN 2328	Poison	II	1,2	1	
2,4,4-Trimethylpentyl-2-peroxy phenoxy acetate, *maximum concentration 37%, in solution*	5.2	UN 2961	Organic Peroxide	II	1	5	Control temperature −10 deg C. Emergency temperature 0 deg C

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Optional Hazardous Materials Table—Continued

(1)	(2)	(3)	(4)	(5)	(6)	(7) Vessel Stowage Requirements		
Notes and Symbols	Hazardous Materials Description and Proper Shipping Names	IMO Class	Identification Number	Label(s) required	Packaging Group	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Trimethyl phosphite	3.3	UN 2329	Flammable Liquid	III	1,2	1,2	
N	Trinitro-aniline	1.1D	UN 0153	Explosive (1.1D)	--	--	--	
N	Trinitroanisole	1.1D	UN 0213	Explosive (1.1D)	--	--	--	
N	Trinitrobenzene, *dry or wetted with less than 30% water, by weight*	1.1D	UN 0214	Explosive (1.1D)	--	--	--	
N	Trinitrobenzenesulfonic acid	1.1L	UN 0386	Explosive (1.1L)	--	--	--	
	Trinitrobenzene, wetted *with, by weight, at least 10% water*	4.1	UN 1354	Flammable Solid	I	1	5	Stow 'away from' heavy metals and their compounds
	Trinitrobenzene, wetted *with not less than 30% water, by weight*	4.1	UN 1354	Flammable Solid	I	1,2	5	Stow 'away from' heavy metals and their compounds
N	Trinitrobenzoic acid, *dry or containing, by weight, less than 30% water*	1.1D	UN 0215	Explosive (1.1D)	--	--	--	
	Trinitrobenzoic acid, wetted *with, by weight, at least 10% water*	4.1	UN 1355	Flammable Solid	I	1	5	Stow 'away from' heavy metals and their compounds
	Trinitrobenzoic acid, wetted *with not less than 30% water, by weight*	4.1	UN 1355	Flammable Solid	I	1,2	5	Stow 'away from' heavy metals and their compounds
N	Trinitrochlorobenzene	1.1D	UN 0155	Explosive (1.1D)	--	--	--	
N	Trinitrofluorenone	1.1D	UN 0387	Explosive (1.1D)	--	--	--	
N	Trinitro-m-cresol	1.1D	UN 0216	Explosive (1.1D)	--	--	--	
N	Trinitronaphthalene	1.1D	UN 0217	Explosive (1.1D)	--	--	--	
N	Trinitrophenetole	1.1D	UN 0218	Explosive (1.1D)	--	--	--	
N	Trinitrophenol, *dry or wetted with less than 30% water, by weight*	1.1D	UN 0154	Explosive (1.1D)	--	--	--	
	Trinitrophenol, wetted, *with not less than 30% water, by weight*	4.1	UN 1344	Flammable Solid	I	1,2	5	Stow 'away from' heavy metals and their compounds
	Trinitrophenol, wetted *with not less than 10% water, by weight*	4.1	UN 1344	Flammable Solid	I	1	5	Stow 'away from' heavy metals and their compounds
N	Trinitrophenylmethylnitramine	1.1D	UN 0208	Explosive (1.1D)	--	--	--	
N	Trinitroresorcinol, *containing, by weight, not less than 20% water or mixture of alcohol and water*	1.1D	UN 0394	Explosive (1.1D)	--	--	--	
N	Trinitroresorcinol, *dry or wetted with less than 20% water, by weight (or mixture of alcohol and water)*	1.1D	UN 0219	Explosive (1.1D)	--	--	--	
N	Trinitrotoluene and hexanitrostilbene mixtures *or* Trinitrotoluene and trinitrobenzene mixtures	1.1D	UN 0388	Explosive (1.1D)	--	--	--	
N	Trinitrotoluene, *dry or wetted with less than 30% water, by weight*	1.1D	UN 0209	Explosive (1.1D)	--	--	--	
N	Trinitrotoluene mixtures containing trinitrobenzene and hexanitrostilbene	1.1D	UN 0389	Explosive (1.1D)	--	--	--	

	Trinitrotoluene, wetted *with, by weight, at least 10% water*	4.1	UN 1356	Flammable Solid	I	1	5	Stow 'away from' heavy metals and their compounds
	Trinitrotoluene, wetted *with not less than 30% water, by weight*	4.1	UN 1356	Flammable Solid	I	1,2	5	Stow 'away from' heavy metals and their compounds
	Tripropylaluminum	4.2	UN 2718	Spontaneously Combustible	I	1	5	
	Tripropylamine	3.3	UN 2260	Flammable Liquid, Corrosive	II	1,2	1,2	
	Tripropylene	3.2 3.3	UN 20[illegible] UN 2057	Flammable Liquid Flammable Liquid	II II	1,2 1,2	1 1,2	
	Tris-(1-aziridinyl)phosphine oxide, solution	6.1	UN 2501	Poison	II	1,2	1,2	Stow 'away from' living quarters
N	Tritonal	1.1D	UN 0390	Explosive (1.1D)	--	--	--	
	Tungsten hexafluoride	2.3	UN 2196	Poison Gas	--	1	5	
	Turpentine	3.3	UN 1299	Flammable Liquid	III	1,2	1,2	
	Turpentine substitute	3.2 3.3	UN 1300 UN 1300	Flammable Liquid Flammable Liquid	II II	1,2 1,2	1 1,2	
	U D M H. See Dimethylhydrazine, unsymmetrical							
	Undecane	3.3	UN 2330	Flammable Liquid	III	1,2	1,2	
	Urea hydrogen peroxide	5.1	UN 1511	Oxidizer	III	1,2	1,2	Keep dry. Shade from radiant heat
N	Urea nitrate, *dry or containing, by weight, less than 20% water*	1.1D	UN 0220	Explosive (1.1D)	--	--	--	
	Urea nitrate, wetted *with not less than 10% water, by weight*	4.1	UN 1357	Flammable Solid	I	1,2	1,2	
	Urea nitrate, wetted *with not less than 20% water, by weight*	4.1	UN 1357	Flammable Solid	I	1,2	1,2	
	Valeraldehyde	3.2	UN 2058	Flammable Liquid	II	1,2	1	
	Valeryl chlorides	8	UN 2502	Corrosive	II	1	1	Keep dry
	Vanadium oxitrichloride	8	UN 2443	Corrosive	II	1	1	Keep dry. Stow 'away from' organic compounds
	Vanadium pentoxide, *non-fused form*	6.1	UN 2862	Poison	II	1,2	1,2	Stow 'away from' living quarters
	Vanadium tetrachloride	8	UN 2444	Corrosive	I	1	1	Keep dry. Glass carboys prohibited on passenger vessels
	Vanadium trichloride	8	UN 2475	Corrosive	III	1,2	1,2	Keep dry
	Vanadium trioxide, *non-fused form*	6.1	UN 2860	Poison	II	1,2	1,2	Stow 'away from' living quarters
	Vanadyl sulphate	6.1	UN 2931	Poison	II	1,2	1,2	Stow 'away from' living quarters
	Varnish. *See* Paints, *etc.*							
	Vinyl acetate, *inhibited*	3.2	UN 1301	Flammable Liquid	II	1,2	1	
	Vinyl bromide, *inhibited*	2.1	UN 1085	Flammable Gas	--	1,2	1	Stow 'away from' living quarters
	Vinyl butyrate, inhibited	3.2	UN 2838	Flammable Liquid	II	1,2	1	
	Vinyl chloride, *inhibited*	2.1	UN 1086	Flammable Gas	--	1,2	1	Stow 'away from' living quarters
	Vinyl chloroacetate	6.1	UN 2589	Poison, Flammable Liquid	II	1,2	1,2	Segregation same as for flammable liquids
	Vinyl ethyl ether, *inhibited*	3.1	UN 1302	Flammable Liquid	I	1,3	5	Keep cool
	Vinyl fluoride, *inhibited*	2.1	UN 1860	Flammable Gas	--	1,2	1	Stow 'away from' living quarters
	Vinylidene chloride, *inhibited*	3.1	UN 1303	Flammable Liquid	I	1,2	5	Keep cool
	Vinyl isobutyl ether, *inhibited*	3.2	UN 1304	Flammable Liquid	II	1,2	1	
	Vinyl methyl ether, *inhibited*	2.1	UN 1087	Flammable Gas	--	1,2	1	

Optional Hazardous Materials Table—Continued

(1)	(2)	(3)	(4)	(5)	(6)	(7)		
						Vessel Stowage Requirements		
Notes and Symbols	Hazardous Materials Description and Proper Shipping Names	IMO Class	Identification Number	Label(s) required	Packaging Group	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
	Vinyl toluenes *(mixed isomers), inhibited*	3.3	UN 2618	Flammable Liquid	III	1,2	1,2	
	Vinyl trichlorosilane, inhibited	3.2	UN 1305	Flammable Liquid, Corrosive	I	1,2	1	
N	Warheads, rocket, *with burster or expelling charge*	1.4D	UN 0370	Explosive (1.4D)	--	--	--	
N	Warheads, rocket, *with burster or expelling charge*	1.4F	UN 0371	Explosive (1.4F)	--	--	--	
N	Warheads, rocket, *with bursting charge*	1.1D	UN 0286	Explosive (1.1D)	--	--	--	
N	Warheads, rocket, *with bursting charge*	1.2D	UN 0287	Explosive (1.2D)	--	--	--	
N	Warheads, rocket, *with bursting charge*	1.1F	UN 0369	Explosive (1.1F)	--	--	--	
N	Warheads, torpedo, *with bursting charge*	1.1D	UN 0221	Explosive (1.1D)	--	--	--	
	White asbestos. *See* Asbestos, white							
	White phosphorus, *dry. See* Phosphorus, *white or yellow, dry*							
	White phosphorus, *wet. See* Phosphorus, *white or yellow, in water*							
	Wood alcohol. See Methanol							
	Wool waste, *wet*	4.2	UN 1387	Spontaneously Combustible	III	1,2	1,2	
	Xenon	2.2	UN 2036	Nonflammable Gas	--	1,2	1,2	
	Xenon, refrigerated liquid	2.2	UN 2591	Nonflammable Gas	--	1,2	1	
	Xylenes	3.2	UN 1307	Flammable Liquid	II	1,2	1	
		3.3	UN 1307	Flammable Liquid	II	1,2	1,2	
	Xylenols	6.1	UN 2261	Poison	II	1,2	1,2	
	Xylidines	6.1	UN 1711	Poison	II	1,2	1,2	Stow 'away from' acids
	Xylols. See Xylenes							
	Xylyl bromide	6.1	UN 1701	Poison	II	1	5	
	Yellow phosphorus, *dry. See* Phosphorus, *white or yellow, dry*							
	Yellow phosphorus, *wet. See* Phosphorus, *white or yellow, in water*							
	Zinc arsenate *or* Zinc arsenite, *or* mixtures *thereof, solid*	6.1	UN 1712	Poison	II	1,2	1,2	
	Zinc ashes	4.3	UN 1435	Dangerous When Wet	III	1,2	1,2	
	Zinc bromate	5.1	UN 2469	Oxidizer	III	1,2	1,2	Stow 'away from' powdered metals and 'separated from' ammonium compounds
	Zinc chlorate	5.1	UN 1513	Oxidizer	II	1,2	1,2	Stow 'away from' powdered metals, 'separated from' ammonium compounds
	Zinc chloride, anhydrous	8	UN 2331	Corrosive	III	1,2	1,2	Keep dry
	Zinc chloride, solution	8	UN 1840	Corrosive	III	1,2	1,2	

	Zinc cyanide	6.1	UN 1713	Poison	I	1,2	1,2	Stow 'away from' acids
	Zinc hydrosulphite	9	UN 1931	None	III	1,2	1,2	Keep dry. Stow 'away from' acids
	Zinc nitrate	5.1	UN 1514	Oxidizer	II	1,2	1,2	
	Zinc permanganate	5.1	UN 1515	Oxidizer	II	1,2	1,2	Stow 'separated from' ammonium compounds and hydrogen peroxide
	Zinc peroxide	5.1	UN 1516	Oxidizer	II	1,2	1,2	Keep dry
	Zinc phosphide	4.3	UN 1714	Dangerous When Wet, Poison	I	1,2	5	When stowed under deck, stow in a mechanically ventilated space
	Zinc, *powder or dust, pyrophoric. See* Pyrophoric metals							
	Zinc powder *or* zinc dust, *non-pyrophoric*	4.3	UN 1436	Dangerous When Wet	II	1,2	1,2	
	Zinc resinate	4.1	UN 2714	Flammable Solid	III	1,2	1,2	
	Zinc silicofluoride	6.1	UN 2855	St. Andrews Cross	III	1,2	1,2	Stow 'away from' acids
	Zirconium hydride	4.1	UN 1437	Flammable Solid	II	1,2	5	
	Zirconium, *metal, dry, finished metal sheets, strip or coiled wire (thinner than 18 microns)*	4.2	UN 2009	Spontaneously Combustible	III	1	5	
	Zirconium, *metal, dry, finished sheets, strip or coiled wire (thinner than 254 microns but not thinner than 18 microns)*	4.1	UN 2858	Flammable Solid	III	1,2	1,2	
	Zirconium *metal* powder, *dry mechanically produced, particle size between 3 and 53 microns, or chemically produced, particle size between 10 and 840 microns*	4.2	UN 2008	Spontaneously Combustible	II	1	5	
	Zirconium *metal* powder, *wetted with not less than 25% water (a visible excess of water must be present), mechanically produced, having a particle size less than 53 microns; or chemically produced, having a particle size less than 840 microns*	4.1	UN 1358	Flammable Solid	II	1,2	5	
	Zirconium nitrate	5.1	UN 2728	Oxidizer	III	1,2	1,2	Shade from radiant heat
N	Zirconium picramate, *dry or wetted with less than 20% water, by weight*	1.3C	UN 0236	Explosive (1.3C)	--	--	--	
	Zirconium picramate, wetted with, *by weight, at least 20% water*	5.1	UN 1517	Oxidizer	I	1	5	Stow 'away from' heavy metals and their salts
	Zirconium, *scrap*	4.2	UN 1932	Spontaneously Combustible	III	1	5	
	Zirconium, *suspended in flammable liquid*	3.1	UN 1308	Flammable Liquid	II	1	5	Keep cool
	Zirconium tetrachloride	8	UN 2503	Corrosive	III	1,2	1,2	Keep dry

(49 U.S.C. 1803, 1804, 1808, 49 CFR 1.53, App. A to Part 1)

[Amdt. 72-58, 45 FR 34647, May 22, 1980; 45 FR 74652, Nov. 10, 1980, as amended by Amdt. 172-75, 47 FR 44471, Oct. 7, 1982; Amdt. 172-84, 48 FR 50234, Oct. 31, 1983; Amdt. 172-94, 49 FR 38137 Sept. 27, 1984]

APPENDIX A TO SUBPART B—IDENTIFICATION NUMBER CROSS REFERENCE TO PROPER SHIPPING NAMES IN §§ 172.101 AND 172.102

This listing is provided for information purposes only.

(1)—Identification Number	(2)—Source 172.***	(3)—Description
UN 0001	102	Alarm devices, explosive
UN 0004	102	Ammonium picrate
UN 0005	102	Cartridges for weapons
UN 0006	102	Cartridges for weapons
UN 0007	102	Cartridges for weapons
UN 0009	102	Ammunition, incendiary
UN 0010	102	Ammunition, incendiary
UN 0012	102	Cartridges for weapons
UN 0014	102	Cartridges for weapons, blank *or* Cartridges, safety, blank
UN 0015	102	Ammunition, smoke
UN 0016	102	Ammunition, smoke
UN 0018	102	Ammunition, tear producing
UN 0019	102	Ammunition, tear producing
UN 0020	102	Ammunition, toxic
UN 0021	102	Ammunition, toxic
UN 0027	102	Black powder
UN 0028	102	Black powder, compressed
UN 0029	102	Detonators, non-electric
UN 0030	102	Detonators, electric
UN 0033	102	Bombs
UN 0034	102	Bombs
UN 0035	102	Bombs
UN 0037	102	Bombs, photo-flash
UN 0038	102	Bombs, photo-flash
UN 0039	102	Bombs, photo-flash
UN 0042	102	Boosters
UN 0043	102	Bursters
UN 0044	102	Primers, cap type
UN 0048	102	Charges, demolition
UN 0049	102	Cartridges, flash
UN 0050	102	Cartridges, flash
UN 0054	102	Cartridges, signal
UN 0055	102	Cases, cartridges, empty, with primer
UN 0056	102	Charges, depth
UN 0059	102	Charges, shaped, commercial
UN 0060	102	Charges, supplementary, explosive
UN 0065	102	Cord, detonating
UN 0066	102	Cord, igniter
UN 0070	102	Cutters, cable, explosive
UN 0072	102	Cyclotrimethylenetrinitramine, wetted
UN 0073	102	Detonators for ammunition
UN 0074	102	Diazodinitrophenol
UN 0075	102	Diethyleneglycol dinitrate, desensitized
UN 0076	102	Dinitrophenol
UN 0077	102	Dinitrophenolates
UN 0078	102	Dinitroresorcinol
UN 0079	102	Hexanitrodiphenylamine
UN 0081	102	Explosives, blasting, Type A
UN 0082	102	Explosives, blasting, Type B
UN 0083	102	Explosives, blasting, Type C
UN 0084	102	Explosives, blasting, Type D
UN 0092	102	Flares, surface
UN 0093	102	Flares, aerial
UN 0094	102	Photo-flash powder
UN 0095	102	Photo-flash powder
UN 0099	102	Fracturing devices, explosive
UN 0101	102	Fuse, instantaneous, non-detonating
UN 0102	102	Cord, detonating
UN 0103	102	Fuse, igniter
UN 0104	102	Cord, detonating, mild effect
UN 0105	102	Fuse, safety
UN 0106	102	Fuzes, detonating
UN 0107	102	Fuzes, detonating
UN 0110	102	Grenades, practice
UN 0113	102	Guanyl nitrosamino guanylidene hydrazine
UN 0114	102	Guanyl nitrosamino guanyl tetrazene
UN 0118	102	Hexolite
UN 0121	102	Igniters
UN 0124	102	Jet perforating guns, charged
UN 0129	102	Lead azide
UN 0130	102	Lead styphnate
UN 0131	102	Lighters, fuse
UN 0132	102	Deflagrating metal salts of aromatic nitro-derivatives, n.o.s.
UN 0133	102	Mannitol hexanitrate
UN 0135	102	Mercury fulminate
UN 0136	102	Mines
UN 0137	102	Mines
UN 0138	102	Mines
UN 0143	102	Nitroglycerine, desensitized
UN 0144	102	Nitroglycerine, spirit of
UN 0146	102	Nitrostarch
UN 0147	102	Nitro urea
UN 0150	102	Pentaerythrite tetranitrate, wetted
UN 0151	102	Pentolite
UN 0153	102	Trinitro-aniline
UN 0154	102	Trinitrophenol
UN 0155	102	Trinitrochlorobenzene
UN 0158	102	Potassium salts of nitro-aromatic derivatives
UN 0159	102	Powder cake, wetted
UN 0160	102	Powder, smokeless
UN 0161	102	Powder, smokeless
UN 0167	102	Projectiles
UN 0168	102	Projectiles
UN 0169	102	Projectiles
UN 0171	102	Ammunition, illuminating
UN 0173	102	Release devices, explosive
UN 0174	102	Rivets, explosive
UN 0180	102	Rockets
UN 0181	102	Rockets
UN 0182	102	Rockets
UN 0183	102	Rockets
UN 0186	102	Rocket motors
UN 0190	102	Samples, explosive
UN 0191	102	Signal devices, hand
UN 0192	102	Signals, railway track, explosive
UN 0193	102	Signals, railway track, explosive
UN 0194	102	Signals, distress
UN 0195	102	Signals, distress
UN 0196	102	Signals, smoke
UN 0197	102	Signals, smoke
UN 0203	102	Sodium salts of nitro-aromatic derivatives, n.o.s.
UN 0204	102	Sounding devices, explosive
UN 0206	102	Squibs
UN 0207	102	Tetranitro-aniline

(1)—Identification Number	(2)—Source 172.***	(3)—Description
UN 0208	102	Trinitrophenylmethylnitramine
UN 0209	102	Trinitrotoluene
UN 0212	102	Tracers for ammunition
UN 0213	102	Trinitroanisole
UN 0214	102	Trinitrobenzene
UN 0215	102	Trinitrobenzoic acid
UN 0216	102	Trinitro-m-cresol
UN 0217	102	Trinitronaphthalene
UN 0218	102	Trinitrophenetole
UN 0219	102	Trinitroresorcinol
UN 0220	102	Urea nitrate
UN 0221	102	Warheads, torpedo
UN 0222	102	Ammonium nitrate
UN 0223	102	Ammonium nitrate fertilizers
UN 0224	102	Barium azide
UN 0225	102	Boosters, with detonator
UN 0226	102	Cyclotetramethylenetetranitramine, wetted
UN 0234	102	Sodium dinitro-o-cresolate
UN 0235	102	Sodium picramate
UN 0236	102	Zirconium picramate
UN 0237	102	Charges, shaped, flexible, linear
UN 0238	102	Rockets, line throwing
UN 0240	102	Rockets, line throwing
UN 0241	102	Explosives, blasting, Type E
UN 0242	102	Charges, propelling, for cannon
UN 0243	102	Ammunition, incendiary, white phosphorus
UN 0244	102	Ammunition, incendiary, white phosphorus
UN 0245	102	Ammunition, smoke, white phosphorus
UN 0246	102	Ammunition, smoke, white phosphorus
UN 0247	102	Ammunition, incendiary
UN 0248	102	Contrivances, water-activated
UN 0249	102	Contrivances, water-activated
UN 0250	102	Rocket motors
UN 0254	102	Ammunition, illuminating
UN 0255	102	Detonators, electric
UN 0257	102	Fuzes, detonating
UN 0266	102	Octolite
UN 0267	102	Detonators, non-electric
UN 0268	102	Boosters, with detonator
UN 0271	102	Charges, propelling, for rocket motors
UN 0272	102	Charges, propelling, for rocket motors
UN 0273	102	Charges, propelling, for rocket motors
UN 0274	102	Charges, propelling, for rocket motors
UN 0275	102	Cartridges, power device
UN 0276	102	Cartridges, power device
UN 0277	102	Cartridges, oil well
UN 0278	102	Cartridges, oil well
UN 0279	102	Charges, propelling, for cannon
UN 0280	102	Rocket motors
UN 0281	102	Rocket motors
UN 0282	102	Nitroguanidine
UN 0283	102	Boosters
UN 0284	102	Grenades
UN 0285	102	Grenades
UN 0286	102	Warheads, rocket
UN 0287	102	Warheads, rocket
UN 0288	102	Charges, shaped, flexible, linear
UN 0289	102	Cord, detonating
UN 0290	102	Cord, detonating
UN 0291	102	Bombs
UN 0292	102	Grenades
UN 0293	102	Grenades
UN 0294	102	Mines
UN 0295	102	Rockets
UN 0296	102	Sounding devices, explosive
UN 0297	102	Ammunition, illuminating
UN 0299	102	Bombs, photo-flash
UN 0300	102	Ammunition, incendiary
UN 0301	102	Ammunition, tear-producing
UN 0303	102	Ammunition, smoke
UN 0305	102	Photo-flash powder
UN 0306	102	Tracers for ammunition
UN 0312	102	Cartridges, signal
UN 0313	102	Signals, smoke
UN 0314	102	Igniters
UN 0315	102	Igniters
UN 0316	102	Fuzes, igniting
UN 0317	102	Fuzes, igniting
UN 0318	102	Grenades, practice
UN 0319	102	Primers, tubular
UN 0320	102	Primers, tubular
UN 0321	102	Cartridges for weapons
UN 0322	102	Rocket motors
UN 0323	102	Cartridges, power device
UN 0324	102	Projectiles
UN 0325	102	Igniters
UN 0326	102	Cartridges for weapons, blank
UN 0327	102	Cartridges for weapons, blank
UN 0328	102	Cartridges for weapons, with inert projectile
UN 0329	102	Torpedoes
UN 0330	102	Torpedoes
UN 0331	102	Explosives, blasting, Type B
UN 0332	102	Explosives, blasting, Type E
UN 0333	102	Fireworks, Type A
UN 0334	102	Fireworks, Type B
UN 0335	102	Fireworks, Type C
UN 0336	102	Fireworks, Type D
UN 0337	102	Fireworks, Type D
UN 0338	102	Cartridges for weapons, blank
UN 0339	102	Cartridges for weapons, with inert projectile
UN 0340	102	Nitrocellulose
UN 0341	102	Nitrocellulose
UN 0342	102	Nitrocellulose, wetted
UN 0343	102	Nitrocellulose, plasticized
UN 0344	102	Projectiles
UN 0345	102	Projectiles
UN 0346	102	Projectiles
UN 0347	102	Projectiles
UN 0348	102	Cartridges for weapons
UN 0349	102	Articles, explosive, n.o.s.
UN 0350	102	Articles, explosive, n.o.s.
UN 0351	102	Articles, explosive, n.o.s.
UN 0352	102	Articles, explosive, n.o.s.
UN 0353	102	Articles, explosive, n.o.s.
UN 0354	102	Articles, explosive, n.o.s.
UN 0355	102	Articles, explosive, n.o.s.
UN 0356	102	Articles, explosive, n.o.s.
UN 0357	102	Substances, explosive, n.o.s.
UN 0358	102	Substances, explosive, n.o.s.
UN 0359	102	Substances, explosive, n.o.s.
UN 0360	102	Detonator assemblies, non-electric
UN 0361	102	Detonator assemblies, non-electric
UN 0362	102	Ammunition, practice
UN 0363	102	Ammunition, proof
UN 0364	102	Detonators for ammunition
UN 0365	102	Detonators for ammunition
UN 0366	102	Detonators for ammunition
UN 0367	102	Fuzes, detonating
UN 0368	102	Fuzes, igniting
UN 0369	102	Warheads, rocket
UN 0370	102	Warheads, rocket

(1)—Identification Number	(2)—Source 172.***	(3)—Description
UN 0371	102	Warheads, rocket
UN 0372	102	Grenades, practice
UN 0373	102	Signal devices, hand
UN 0374	102	Sounding devices, explosive
UN 0375	102	Sounding devices, explosive
UN 0376	102	Primers, tubular
UN 0377	102	Primers, cap type
UN 0378	102	Primers, cap type
UN 0379	102	Cases, cartridge, empty, with primer
UN 0380	102	Articles, pyrophoric
UN 0381	102	Cartridges, power device
UN 0382	102	Components, explosive train, n.o.s.
UN 0383	102	Components, explosive train, n.o.s.
UN 0384	102	Components, explosive train, n.o.s.
UN 0385	102	5-Nitrobenzotriazol
UN 0386	102	Trinitrobenzenesulfonic acid
UN 0387	102	Trinitrofluorenone
UN 0388	102	Trinitrotoluene and hexanitrostilbene mixtures *or* Trinitrotoluene and trinitrobenzene mixtures
UN 0389	102	Trinitrotoluene mixtures containing trinitrobenzene and hexanitrostilbene
UN 0390	102	Tritonal
UN 0391	102	Cyclotrimethylenetrinitramine and cyclotetramethylenetetranitramine, mixtures, wetted
UN 0392	102	Hexanitrostilbene
UN 0393	102	Hexotonal, cast
UN 0394	102	Trinitroresorcinol
UN 0395	102	Rocket motors, liquid fueled
UN 0396	102	Rocket motors, liquid fueled
UN 0397	102	Rockets, liquid fueled
UN 0398	102	Rockets, liquid fueled
UN 0399	102	Bombs, containing flammable liquid
UN 0400	102	Bombs, containing flammable liquid
UN 0401	102	Dipicryl sulfide
UN 0402	102	Ammonium perchlorate
UN 0403	102	Flares, aerial
UN 0404	102	Flares, aerial
UN 0405	102	Cartridges, signal
UN 0406	102	Dinitrosobenzene
UN 0407	102	Tetrazol-1-acetic acid
UN 0408	102	Fuzes, detonating
UN 0409	102	Fuzes, detonating
UN 0410	102	Fuzes, detonating
UN 0411	102	Pentaerythrite tetranitrate
UN 0412	102	Cartridges for weapons
UN 0413	102	Cartridges for weapons, blank
UN 0414	102	Charges, propelling, for cannon
UN 0415	102	Charges, propelling, for rocket motors
UN 0416	102	Charges, propelling, for rocket motors
UN 0417	102	Cartridges for weapons, with inert projectile
UN 0418	102	Flares, surface
UN 0419	102	Flares, surface
UN 0420	102	Flares, aerial
UN 0421	102	Flares, aerial
UN 0422	102	Squibs
UN 0423	102	Squibs
UN 0424	102	Projectiles
UN 0425	102	Projectiles
UN 0426	102	Projectiles
UN 0427	102	Projectiles
UN 1001	101	Acetylene
UN 1002	102	Air
UN 1002	101	Air, compressed
UN 1003	102	Air
UN 1005	102	Ammonia

(1)—Identification Number	(2)—Source 172.***	(3)—Description
UN 1005	101	Ammonia, anhydrous
UN 1006	102	Argon
UN 1006	101	Argon *or* Argon, compressed
UN 1008	101	Boron trifluoride
UN 1009	101	Bromotrifluoromethane
UN 1010	102	Butadiene
UN 1010	101	Butadiene, inhibited
UN 1011	102	Butane *or* butane mixtures
UN 1012	102	Butylene
UN 1013	101	Carbon dioxide
UN 1014	102	Carbon dioxide and oxygen
UN 1014	101	Carbon dioxide-oxygen mixture
UN 1015	102	Carbon dioxide and nitrous oxide
UN 1015	101	Carbon dioxide-nitrous oxide mixture
UN 1016	101	Carbon monoxide
UN 1017	101	Chlorine
UN 1018	101	Chlorodifluoromethane
UN 1020	101	Chloropentafluoroethane
UN 1021	101	Chlorotetrafluoroethane
UN 1022	101	Chlorotrifluoromethane
UN 1023	102	Coal gas
UN 1026	102	Cyanogen
UN 1026	101	Cyanogen gas
UN 1027	101	Cyclopropane
UN 1027	102	Cyclopropane, liquefied
UN 1028	101	Dichlorodifluoromethane
UN 1029	102	Dichloromonofluoromethane
UN 1030	102	1,1-Difluoroethane
UN 1030	101	Difluoroethane
UN 1032	102	Dimethylamine
UN 1032	101	Dimethylamine, anhydrous
UN 1033	101	Dimethyl ether
UN 1035	102	Ethane
UN 1035	101	Ethane *or* Ethane, compressed
UN 1036	102	Ethylamine
UN 1036	101	Monoethylamine
UN 1037	101	Ethyl chloride
UN 1038	102	Ethylene
UN 1038	101	Ethylene, refrigerated liquid
UN 1039	101	Ethyl methyl ether
UN 1040	101	Ethylene oxide
UN 1041	102	Carbon dioxide and ethylene oxide mixtures
NA 1043	101	Crude nitrogen fertilizer solution
UN 1043	101	Fertilizer ammoniating solution
NA 1043	101	Nitrogen fertilizer solution
UN 1044	101	Fire extinguisher
UN 1044	102	Fire extinguishers
UN 1045	101	Fluorine
UN 1046	102	Helium
UN 1046	101	Helium *or* Helium, compressed
UN 1048	101	Hydrogen bromide
UN 1048	102	Hydrogen bromide, anhydrous
UN 1049	102	Hydrogen
UN 1049	101	Hydrogen *or* Hydrogen, compressed
UN 1050	101	Hydrogen chloride *or* Hydrogen chloride, anhydrous
UN 1050	102	Hydrogen chloride, anhydrous
NA 1051	101	Hydrocyanic acid, liquefied
UN 1051	102	Hydrogen cyanide, anhydrous, stabilized
UN 1052	101	Hydrogen fluoride
UN 1052	102	Hydrogen fluoride, anhydrous
UN 1053	101	Hydrogen sulfide
UN 1053	102	Hydrogen sulphide
UN 1055	102	Isobutylene
UN 1056	102	Krypton
UN 1057	101	Cigarette lighter
UN 1057	102	Lighters for cigars and cigarettes

(1)—Identification Number	(2)—Source 172.***	(3)—Description
NA 1058	101	Liquefied nonflammable gas
UN 1058	102	Liquefied non-flammable gases
UN 1060	102	Methyl acetylene *and* propadiene
UN 1060	101	Methylacetylene-propadiene, stabilized
UN 1061	102	Methylamine
UN 1061	101	Methylamine, anhydrous
UN 1062	102	Methyl bromide
UN 1062	101	Methyl bromide, liquid
UN 1063	101	Methyl chloride
UN 1064	101	Methyl mercaptan
UN 1064	102	Methylmercaptan
UN 1065	102	Neon
UN 1065	101	Neon *or* Neon, compressed
UN 1066	102	Nitrogen
UN 1066	101	Nitrogen *or* Nitrogen, compressed
UN 1067	102	Nitrogen dioxide
UN 1067	101	Nitrogen dioxide, liquid
NA 1067	101	Nitrogen peroxide, liquid
NA 1067	101	Nitrogen tetroxide, liquid
UN 1069	101	Nitrosyl chloride
UN 1070	102	Nitrous oxide
UN 1070	101	Nitrous oxide *or* Nitrous oxide, compressed
UN 1071	102	Oil gas
UN 1072	102	Oxygen
UN 1072	101	Oxygen *or* Oxygen, compressed
UN 1073	102	Oxygen
UN 1073	101	Oxygen, refrigerated liquid
UN 1075	101	Liquefied petroleum gas
UN 1075	102	Petroleum gases, liquefied
UN 1076	101	Phosgene
UN 1077	102	Propylene
UN 1078	102	Refrigerant gases, n.o.s.
UN 1078	101	Refrigerant gas, n.o.s. *or* Dispersant gas, n.o.s.
UN 1079	101	Sulfur dioxide
UN 1079	102	Sulphur dioxide
UN 1080	101	Sulfur hexafluoride
UN 1080	102	Sulphur hexafluoride
UN 1081	101	Tetrafluoroethylene, inhibited
UN 1082	101	Trifluorochloroethylene
UN 1082	102	Trifluorochloroethylene, inhibited
UN 1083	101	Trimethylamine, anhydrous
UN 1085	102	Vinyl bromide
UN 1086	101	Vinyl chloride
UN 1087	101	Vinyl methyl ether
UN 1088	101	Acetal
UN 1089	101	Acetaldehyde
UN 1090	101	Acetone
UN 1091	101	Acetone oil
UN 1091	102	Acetone oils
UN 1092	101	Acrolein, inhibited
UN 1093	101	Acrylonitrile
UN 1093	102	Acrylonitrile, inhibited
UN 1098	101	Allyl alcohol
UN 1099	101	Allyl bromide
UN 1100	101	Allyl chloride
UN 1101	102	Diethylaluminum chloride
UN 1102	102	Triethylaluminum
UN 1103	102	Trimethylaluminum
UN 1104	101	Amyl acetate
UN 1104	102	Amyl acetates
UN 1105	102	Amyl alcohols
UN 1106	101	Amylamine
UN 1107	101	Amyl chloride
UN 1108	101	Amylene
UN 1108	102	n-Amylene
UN 1109	101	Amyl formate
UN 1109	102	Amyl formates
UN 1110	102	Amyl methyl ketone
UN 1110	101	Methyl amyl ketone
UN 1111	101	Amyl mercaptan
UN 1112	102	Amyl nitrate
UN 1113	101	Amyl nitrite
UN 1114	101	Benzene
UN 1115	101	Benzine
UN 1118	102	Brake fluid
UN 1120	102	Butanol
NA 1120	101	Butyl alcohol
UN 1120	102	sec-Butanol
UN 1120	102	tert-Butanol
UN 1123	101	Butyl acetate
UN 1123	102	Butyl acetates
UN 1125	101	Butylamine
UN 1125	102	n-Butylamine
UN 1126	101	Butyl bromide
UN 1126	102	n-Butyl bromide
UN 1127	101	Butyl chloride
UN 1127	102	Chlorobutanes
UN 1128	101	Butyl formate
UN 1128	102	n-Butyl formate
UN 1129	101	Butyraldehyde
UN 1130	101	Camphor oil
UN 1131	101	Carbon bisulfide, *or* Carbon disulfide
UN 1131	102	Carbon disulphide
UN 1132	102	Carbon remover
UN 1132	101	Carbon remover, liquid
UN 1133	101	Adhesive
UN 1133	102	Adhesives
NA 1133	101	Cement
NA 1133	101	Cement, container, linoleum, tile, *or* wallboard, liquid
NA 1133	101	Cement, leather
NA 1133	101	Cement, pyroxylin
NA 1133	101	Cement, roofing, liquid
NA 1133	101	Cement, rubber
UN 1134	101	Chlorobenzene
UN 1135	101	Ethylene chlorohydrin
UN 1136	101	Coal tar distillate
NA 1136	101	Coal tar light oil
NA 1136	101	Coal tar oil
UN 1137	101	Coal tar distillate
NA 1137	101	Coal tar light oil
NA 1137	101	Coal tar oil
UN 1139	101	Coating solution
NA 1142	101	Antifreeze compound, liquid
NA 1142	101	Antifreeze preparation, liquid
NA 1142	101	Compound, polishing, liquid
NA 1142	101	Compound, vulcanizing, liquid
NA 1142	101	Dressing, leather
UN 1142	102	Flammable liquid preparations, n.o.s.
NA 1142	101	Leather bleach *or* dressing
NA 1142	101	Polish, metal, stove, furniture *or* wood, liquid
NA 1142	101	Rust preventive coating
UN 1143	101	Crotonaldehyde
UN 1143	102	Crotonaldehyde, inhibited
UN 1144	101	Crotonylene
UN 1145	101	Cyclohexane
UN 1146	101	Cyclopentane
UN 1147	101	Decahydronaphthalene
UN 1148	102	Diacetone alcohol
UN 1148	101	Diacetone alcohol
UN 1149	101	Butyl ether
UN 1149	102	Dibutyl ethers
UN 1150	101	Dichloroethylene
UN 1152	101	Dichloropentane
UN 1152	102	Dichloropentanes
UN 1153	101	Ethylene glycol diethyl ether

(1)—Identification Number	(2)—Source 172.***	(3)—Description
UN 1154	101	Diethylamine
UN 1155	102	Diethyl ether
UN 1155	101	Ethyl ether
UN 1156	101	Diethyl ketone
UN 1157	101	Diisobutyl ketone
UN 1158	101	Diisopropylamine
UN 1159	101	Diisopropyl ether
UN 1160	101	Dimethylamine, aqueous solution
UN 1160	102	Dimethylamine, solution
UN 1161	101	Dimethyl carbonate
UN 1162	101	Dimethyldichlorosilane
UN 1163	101	Dimethylhydrazine, unsymmetrical
UN 1164	101	Dimethyl sulfide
UN 1164	102	Dimethyl sulphide
UN 1165	101	Dioxane
UN 1166	101	Dioxolane
UN 1167	101	Divinyl ether
UN 1167	102	Divinyl ether, inhibited
UN 1168	102	Driers
UN 1168	101	Driers, paint *or* varnish, liquid, n.o.s.
UN 1169	102	Extracts, aromatic, liquid
UN 1170	101	Alcoholic beverage
NA 1170	101	Cologne spirits
UN 1170	102	Ethanol *or* Ethanol solutions
UN 1170	101	Ethyl alcohol
UN 1171	101	Ethylene glycol monoethyl ether
UN 1172	101	Ethylene glycol monoethyl ether acetate
UN 1173	101	Ethyl acetate
UN 1175	101	Ethyl benzene
UN 1175	102	Ethylbenzene
UN 1176	101	Ethyl borate
UN 1177	102	Ethylbutyl acetate
UN 1177	101	Ethyl butyl acetate
UN 1178	102	2-Ethylbutyraldehyde
UN 1178	101	Ethyl butyraldehyde
UN 1179	101	Ethyl butyl ether
UN 1180	101	Ethyl butyrate
UN 1181	101	Ethyl chloroacetate
UN 1182	101	Ethyl chloroformate
UN 1183	101	Ethyl dichlorosilane
UN 1183	102	Ethyldichlorosilane
UN 1184	101	Ethylene dichloride
UN 1185	102	Ethyleneimine
UN 1185	101	Ethylene imine, inhibited
UN 1188	101	Ethylene glycol monomethyl ether
UN 1189	101	Ethylene glycol monomethyl ether acetate
UN 1190	101	Ethyl formate
UN 1191	102	Ethyl hexaldehyde
UN 1191	101	Ethylhexaldehyde
UN 1192	101	Ethyl lactate
UN 1193	101	Ethyl methyl ketone
UN 1193	101	Methyl ethyl ketone
UN 1194	101	Ethyl nitrite (nitrous ether)
UN 1194	102	Ethyl nitrite, solutions
UN 1195	101	Ethyl propionate
UN 1196	101	Ethyl trichlorosilane
UN 1196	102	Ethyltrichlorosilane
UN 1197	101	Extract, liquid, flavoring
UN 1197	102	Extracts, flavouring, liquid
UN 1198	101	Formaldehyde solution
UN 1198	102	Formaldehyde solutions
UN 1199	101	Furfural
UN 1201	101	Fusel oil
UN 1202	102	Gas oil
UN 1203	101	Gasoline
(UN 1203)	102	Motor fuel, n.o.s.
NA 1203	101	Motor fuel, n.o.s.
UN 1204	102	Nitroglycerin solution, in alcohol
NA 1204	101	Spirits of nitroglycerin
NA 1204	101	Spirits of nitroglycerin, not exceeding 1% nitroglycerin by weight
UN 1205	102	Gutta percha solution
UN 1206	101	Heptane
UN 1207	101	Hexaldehyde
UN 1208	101	Hexane
UN 1208	101	Neohexane
UN 1210	101	Ink
UN 1210	102	Ink, printers
UN 1212	102	Isobutanol
UN 1213	101	Isobutyl acetate
UN 1214	101	Isobutylamine
UN 1216	101	Isooctene
UN 1218	101	Isoprene
UN 1218	102	Isoprene, inhibited
UN 1219	101	Isopropanol
UN 1220	101	Isopropyl acetate
UN 1221	101	Isopropylamine
UN 1222	101	Isopropyl nitrate
UN 1223	101	Kerosene
UN 1224	102	Ketones, liquid, n.o.s.
UN 1226	101	Cigarette lighter
UN 1226	101	Lighter fluid
UN 1226	102	Lighter fuels
UN 1226	102	Lighters
NA 1228	101	Mercaptan mixture, aliphatic
UN 1228	102	Mercaptans, liquid, n.o.s. *or* Mercaptan mixtures, liquid, n.o.s.
UN 1229	101	Mesityl oxide
NA 1230	101	Columbian spirits
UN 1230	102	Methanol
UN 1230	101	Methyl alcohol
UN 1231	101	Methyl acetate
UN 1232	101	Methyl acetone
UN 1233	101	Methylamyl acetate
UN 1234	101	Methylal
UN 1235	101	Methylamine, aqueous solution
UN 1237	101	Methyl butyrate
UN 1238	101	Methyl chloroformate
UN 1239	102	Methylchloromethyl ether
UN 1239	101	Methylchloromethyl ether, anhydrous
UN 1242	101	Methyl dichlorosilane
UN 1242	102	Methyldichlorosilane
UN 1243	101	Methyl formate
UN 1244	101	Methylhydrazine
UN 1245	102	Methyl isobutyl ketone
UN 1246	102	Methyl isopropenyl ketone
UN 1246	101	Methyl isopropenyl ketone, inhibited
UN 1247	102	Methyl methacrylate
UN 1247	101	Methyl methacrylate monomer, inhibited
NA 1247	101	Methyl methacrylate monomer, uninhibited
UN 1248	101	Methyl propionate
UN 1249	101	Methyl propyl ketone
UN 1250	101	Methyltrichlorosilane
UN 1251	102	Methyl vinyl ketone
UN 1251	101	Methyl vinyl ketone, inhibited
UN 1255	102	Naphtha, petroleum
UN 1255	101	Petroleum naphtha
UN 1256	101	Naphtha, solvent
UN 1257	102	Casinghead gasoline
UN 1259	101	Nickel carbonyl
UN 1261	101	Nitromethane
UN 1262	101	Isooctane
UN 1262	101	Octane
UN 1263	101	Lacquer base *or* Lacquer chips, plastic
UN 1263	101	Paint
NA 1263	101	Paint related material

(1)—Identification Number	(2)—Source 172.***	(3)—Description
UN 1263	102	Paints, enamels, lacquers, stains, shellac
UN 1264	101	Paraldehyde
UN 1265	101	Isopentane
UN 1265	101	Pentane
UN 1265	102	Pentanes
UN 1266	102	Perfumery products
UN 1267	101	Crude oil, petroleum
UN 1267	102	Petroleum crude oil
NA 1268	101	Naphtha distillate
UN 1268	101	Petroleum distillate
UN 1268	102	Petroleum distillates, n.o.s.
NA 1268	101	Road oil
NA 1270	101	Oil
UN 1270	102	Petroleum oil
UN 1271	101	Petroleum ether
UN 1271	102	Petroleum spirit
UN 1272	101	Pine oil
UN 1274	102	Propanol
UN 1274	101	Propyl alcohol
UN 1275	101	Propionaldehyde
UN 1276	102	n-Propyl acetate
UN 1276	101	Propyl acetate
UN 1277	102	Monopropylamine
UN 1277	101	Propylamine
UN 1278	101	Propyl chloride
UN 1279	101	Propylene dichloride
UN 1280	101	Propylene oxide
UN 1281	101	Propyl formate
UN 1281	102	Propyl formates
UN 1282	101	Pyridine
UN 1286	102	Rosin oil
UN 1287	102	Rubber solution
UN 1288	102	Shale oil
NA 1289	101	Sodium methylate, alcohol mixture
UN 1289	102	Sodium methylate, solutions
UN 1292	101	Ethyl silicate
UN 1292	102	Tetraethyl silicate
UN 1293	102	Tinctures, medicinal
UN 1294	101	Toluene
UN 1295	101	Trichlorosilane
UN 1296	101	Triethylamine
UN 1297	102	Trimethylamine
UN 1297	101	Trimethylamine, aqueous solution
UN 1298	101	Trimethylchlorosilane
UN 1299	101	Turpentine
UN 1300	101	Turpentine substitute
UN 1301	101	Vinyl acetate
UN 1302	102	Vinyl ethyl ether
UN 1302	101	Vinyl ethyl ether, inhibited
UN 1303	102	Vinylidene chloride
UN 1303	101	Vinylidene chloride, inhibited
UN 1304	101	Vinyl isobutyl ether
UN 1305	101	Vinyl trichlorosilane
UN 1305	102	Vinyl trichlorosilane, inhibited
UN 1307	101	Xylene
UN 1307	102	Xylenes
UN 1308	102	Zirconium
UN 1308	101	Zirconium, metal, liquid, suspensions
UN 1309	102	Aluminium powder, coated
UN 1310	101	Ammonium picrate, wet
UN 1310	102	Ammonium picrate, wetted
UN 1312	102	Borneol
UN 1313	101	Calcium resinate
UN 1314	101	Calcium resinate, fused
UN 1318	102	Cobalt resinate
UN 1318	101	Cobalt resinate, precipitated
UN 1320	102	Dinitrophenol, wetted
UN 1321	102	Dinitrophenolates, wetted
UN 1322	102	Dinitroresorcinol, wetted
UN 1323	102	Ferrocerium
NA 1324	101	Film
UN 1324	102	Film, motion picture
NA 1325	101	Antimony sulfide, solid
NA 1325	101	Burnt cotton, not repicked
NA 1325	101	Cosmetics, n.o.s.
NA 1325	101	Drugs, n.o.s.
UN 1325	101	Flammable solid, n.o.s.
UN 1325	102	Flammable solids, n.o.s.
NA 1325	101	Fusee
NA 1325	101	Garbage tankage
NA 1325	101	N-Methyl-N'-nitro-N-nitrosoguanidine
NA 1325	101	Paper stock, wet
NA 1325	101	Pyroxylin plastic, rods, sheets, rolls *or* tubes
NA 1325	101	Pyroxylin plastic, scrap
NA 1325	101	Rags, wet
NA 1325	101	Rough ammoniate tankage
NA 1325	101	Smokeless powder for small arm
NA 1325	101	Tankage fertilizer
NA 1325	101	Tankage, rough ammoniate
NA 1325	101	Waste paper, wet
UN 1326	102	Hafnium
UN 1326	101	Hafnium metal, wet
UN 1327	102	Bhusa
UN 1327	101	Hay
UN 1327	101	Hay *or* straw
UN 1327	102	Straw
UN 1328	102	Hexamine
UN 1330	102	Manganese resinate
UN 1331	102	Matches
UN 1331	101	Matches, strike anywhere
UN 1332	102	Metaldehyde
UN 1333	102	Cerium, crude
UN 1334	102	Naphthalene, crude *or* refined
UN 1334	101	Naphthalene *or* Naphthalin
UN 1336	102	Nitroguanidine, wetted
UN 1336	101	Nitroguanidine, wet with not les than 20% water
UN 1337	102	Nitrostarch, wetted
UN 1337	101	Nitrostarch, wet with not less th 20% water
NA 1337	101	Nitrostarch, wet with not less th 30% alcohol *or* solvent
UN 1338	102	Phosphorus, amorphous
UN 1338	101	Phosphorus, amorphous, red
UN 1339	101	Phosphorus heptasulfide
UN 1339	102	Phosphorus heptasulphide
UN 1340	101	Phosphorus pentasulfide
UN 1340	102	Phosphorus pentasulphide
UN 1341	101	Phosphorus sesquisulfide
UN 1341	102	Phosphorus sesquisulphide
UN 1343	101	Phosphorus trisulfide
UN 1343	102	Phosphorus trisulphide
NA 1344	101	Picric acid, wet, with not less th 10% water
UN 1344	102	Trinitrophenol, wetted
UN 1345	102	Rubber scrap
UN 1345	101	Rubber scrap *or* Rubber buffin
UN 1345	101	Rubber shoddy *or* Rubber, regen ated *or* Rubber, reclaimed
UN 1346	102	Silicon powder
UN 1347	102	Silver picrate, wetted
UN 1348	102	Sodium dinitro-o-cresolate, wett
UN 1349	101	Sodium picramate, wet
UN 1349	102	Sodium picramate, wetted
UN 1350	101	Sulfur, solid
UN 1350	102	Sulphur
UN 1352	102	Titanium

(1)—Identification Number	(2)—Source 172.***	(3)—Description
UN 1352	101	Titanium metal powder, wet with 20% or more water
UN 1353	102	Toe puffs
UN 1354	101	Trinitrobenzene, wet
UN 1354	102	Trinitrobenzene, wetted
UN 1355	101	Trinitrobenzoic acid, wet
UN 1355	102	Trinitrobenzoic acid, wetted
UN 1356	101	Trinitrotoluene, wet
UN 1356	102	Trinitrotoluene, wetted
UN 1357	101	Urea nitrate, wet
UN 1357	102	Urea nitrate, wetted
UN 1358	102	Zirconium
UN 1358	101	Zirconium metal, wet
UN 1359	102	Bags
UN 1359	101	Bags, sodium nitrate, empty and unwashed
UN 1360	101	Calcium phosphide
UN 1361	102	Carbon
NA 1361	101	Charcoal briquettes *or* briquets
NA 1361	101	Charcoal screenings, made from 'pinon' wood
NA 1361	101	Charcoal, shell
NA 1361	101	Charcoal, wood, ground, crushed, granulated, *or* pulverized
NA 1361	101	Charcoal, wood, lump
NA 1361	101	Charcoal wood screenings, other than 'pinon' wood screenings
NA 1361	101	Coal, ground bituminous, sea coal, coal facings
UN 1362	102	Carbon, activated
UN 1362	101	Charcoal, activated
UN 1363	101	Copra
UN 1364	101	Cotton waste, oily
UN 1365	102	Cotton
UN 1366	102	Diethylzinc
UN 1367	102	Diethylmagnesium
UN 1368	102	Dimethylmagnesium
UN 1369	102	p-Nitrosodimethylaniline
UN 1370	102	Dimethylzinc
UN 1371	102	Driers
NA 1372	101	Burnt fiber
NA 1372	101	Fibers
NA 1372	101	Fibers, burnt
UN 1372	102	Fibres, animal or vegetable
NA 1372	101	Hair, wet
NA 1373	101	Fibers *or* fabric, containing more than 5% animal *or* vegetable oil
UN 1373	102	Fibres *or* Fabric, animal *or* vegetable
UN 1374	102	Fishmeal *or* fishscrap
NA 1374	101	Fish meal *or* fish scrap containing less than 6% or more than 12% water
UN 1375	102	Fuel, pyrophoric, n.o.s.
UN 1376	101	Iron mass *or* sponge, spent
UN 1376	102	Iron oxide
UN 1378	101	Nickel catalyst, wet
UN 1378	102	Nickel catalyst, wetted
UN 1379	102	Paper, unsaturated oil treated
UN 1380	101	Pentaborane
UN 1381	102	Phosphorus
UN 1381	101	Phosphorus, white *or* yellow, dry
UN 1381	101	Phosphorus, white *or* yellow, in water
UN 1382	101	Potassium sulfide
UN 1382	102	Potassium sulphide, anhydrous *or* Potassium sulphide
NA 1383	101	Iron mass *or* sponge
UN 1383	102	Pyrophoric metals, n.o.s. *or* Pyrophoric alloys, n.o.s.
UN 1384	102	Sodium dithionite
UN 1384	101	Sodium hydrosulfite
UN 1385	101	Sodium sulfide, anhydrous
UN 1385	102	Sodium sulphide, anhydrous *or* Sodium sulphide
UN 1386	102	Seed cake
UN 1387	101	Waste wool, wet
UN 1387	102	Wool waste
UN 1389	102	Alkali metal amalgams, n.o.s.
UN 1390	102	Alkali metal amides, n.o.s.
UN 1391	102	Alkali metal dispersions, n.o.s. *or* Alkali earth metal dispersions, n.o.s.
UN 1392	102	Alkaline earth metal amalgams, n.o.s.
UN 1393	102	Alkaline earth metal alloys, n.o.s.
UN 1394	102	Aluminium carbide
UN 1395	102	Aluminium ferrosilicon
UN 1396	102	Aluminium, powder, uncoated
UN 1396	101	Aluminum, metallic, powder
UN 1397	102	Aluminium phosphide
UN 1397	101	Aluminum phosphide
UN 1398	102	Aluminium silicon
UN 1399	102	Barium
UN 1400	102	Barium
UN 1401	102	Calcium
UN 1401	101	Calcium, metal
NA 1401	101	Calcium, metal, crystalline
UN 1402	101	Calcium carbide
UN 1403	102	Calcium cyanamide
UN 1403	101	Calcium cyanamide, not hydrated
UN 1404	102	Calcium hydride
UN 1405	102	Calcium silicide
UN 1406	101	Calcium silicon
UN 1407	102	Caesium
UN 1407	101	Cesium metal
UN 1408	101	Ferrosilicon
UN 1409	102	Hydrides
UN 1410	102	Lithium aluminium hydride
UN 1410	101	Lithium aluminum hydride
UN 1411	102	Lithium aluminium hydride
UN 1411	101	Lithium aluminum hydride, ethereal
UN 1412	102	Lithium amide
UN 1412	101	Lithium amide, powdered
UN 1413	101	Lithium borohydride
UN 1414	101	Lithium hydride
UN 1415	102	Lithium
UN 1415	101	Lithium metal
UN 1415	101	Lithium metal, in cartridges
UN 1417	101	Lithium silicon
UN 1418	102	Magnesium powder *or* Magnesium alloys, powder
UN 1419	102	Magnesium aluminium phosphide
UN 1419	101	Magnesium aluminum phosphide
UN 1420	102	Potassium, metal alloys
UN 1420	101	Potassium, metal liquid alloy
UN 1421	102	Alkali metal alloys, liquid
NA 1421	101	Sodium, metal liquid alloy
UN 1422	102	Potassium-sodium
UN 1422	101	Sodium potassium alloy, liquid
UN 1422	101	Sodium potassium alloy, solid
UN 1423	102	Rubidium
UN 1423	101	Rubidium metal
UN 1423	101	Rubidium metal, in cartridges
UN 1424	102	Sodium amalgam
UN 1425	101	Sodium amide
UN 1426	102	Sodium borohydride
UN 1427	101	Sodium hydride
UN 1428	102	Sodium
UN 1428	101	Sodium, metal *or* metallic
UN 1429	102	Sodium

(1)—Identification Number	(2)—Source 172.***	(3)—Description
UN 1429	101	Sodium, metal dispersion in organic solvent
UN 1431	102	Sodium methylate
UN 1431	101	Sodium methylate, dry
UN 1432	101	Sodium phosphide
UN 1433	101	Stannic phosphide
UN 1433	102	Stannic phosphides
UN 1434	102	Strontium
UN 1435	102	Zinc ashes
UN 1436	102	Zinc powder *or* zinc dust
UN 1437	101	Zirconium hydride
UN 1438	102	Aluminium nitrate
UN 1438	101	Aluminum nitrate
UN 1439	101	Ammonium dichromate
UN 1442	101	Ammonium perchlorate
UN 1444	102	Ammonium persulphate
UN 1445	101	Barium chlorate
NA 1445	101	Barium chlorate, wet
UN 1446	101	Barium nitrate
UN 1447	101	Barium perchlorate
UN 1448	101	Barium permanganate
UN 1449	102	Barium peroxide
UN 1449	101	Barium peroxide
UN 1450	102	Bromates, inorganic, n.o.s.
UN 1451	102	Caesium nitrate
UN 1452	101	Calcium chlorate
UN 1453	101	Calcium chlorite
UN 1454	101	Calcium nitrate
UN 1455	102	Calcium perchlorate
UN 1456	101	Calcium permanganate
UN 1457	101	Calcium peroxide
UN 1458	101	Chlorate and borate mixture
UN 1458	102	Chlorate and borate, mixtures
UN 1459	101	Chlorate and magnesium chloride mixture
UN 1459	102	Chlorate and magnesium chloride, mixture
UN 1461	101	Chlorate, n.o.s.
NA 1461	101	Chlorate, n.o.s., wet
UN 1461	102	Chlorates, inorganic, n.o.s.
UN 1462	102	Chlorites, inorganic, n.o.s.
NA 1463	101	Chromic acid mixture, dry
NA 1463	101	Chromic acid, solid
UN 1463	102	Chromium trioxide, anhydrous
UN 1465	102	Didymium nitrate
UN 1466	101	Ferric nitrate
UN 1467	101	Guanidine nitrate
UN 1469	101	Lead nitrate
UN 1470	102	Lead perchlorate
UN 1471	101	Lithium hypochlorite compound, dry
UN 1471	102	Lithium hypochlorite, dry *or* Lithium hypochlorite mixtures
UN 1472	101	Lithium peroxide
UN 1473	102	Magnesium bromate
UN 1474	101	Magnesium nitrate
UN 1475	101	Magnesium perchlorate
UN 1476	102	Magnesium peroxide
UN 1476	101	Magnesium peroxide, solid
NA 1477	101	Ammonium sulfate nitrate
NA 1477	101	Nitrate, n.o.s.
UN 1477	102	Nitrates, inorganic, n.o.s.
UN 1478	102	Sodium nitrate and potash, mixtures
NA 1479	101	Compound, tree *or* weed killing, solid
NA 1479	101	Cosmetics, n.o.s.
NA 1479	101	Cupric nitrate
NA 1479	101	Drugs, n.o.s.
UN 1479	101	Oxidizer, n.o.s. *or* Oxidizing material, n.o.s
UN 1479	102	Oxidizing substances, n.o.s.
NA 1479	101	Potassium dichromate
NA 1479	101	Sodium dichromate
NA 1481	101	Perchlorate, n.o.s.
UN 1481	102	Perchlorates, inorganic, n.o.s.
NA 1482	101	Permanganate, n.o.s.
UN 1482	102	Permanganates, inorganic, n.o.s.
UN 1483	102	Peroxides, inorganic, n.o.s.
UN 1484	101	Potassium bromate
UN 1485	101	Potassium chlorate
UN 1486	101	Potassium nitrate
UN 1487	102	Potassium nitrate and sodium nitrite, mixture
UN 1487	101	Sodium nitrite mixed with potassium nitrate
NA 1487	101	Sodium nitrite mixture
UN 1488	101	Potassium nitrite
UN 1489	101	Potassium perchlorate
UN 1490	101	Potassium permanganate
UN 1491	101	Potassium peroxide
UN 1492	102	Potassium persulphate
UN 1493	101	Silver nitrate
UN 1494	101	Sodium bromate
UN 1495	101	Sodium chlorate
UN 1496	101	Sodium chlorite
UN 1498	101	Sodium nitrate
UN 1499	102	Sodium nitrate and potassium nitrate
UN 1500	101	Sodium nitrite
UN 1502	101	Sodium perchlorate
UN 1503	101	Sodium permanganate
UN 1504	101	Sodium peroxide
UN 1505	102	Sodium persulphate
UN 1506	101	Strontium chlorate
UN 1506	101	Strontium chlorate, wet
UN 1507	101	Strontium nitrate
UN 1508	102	Strontium perchlorate
UN 1509	101	Strontium peroxide
UN 1510	101	Tetranitromethane
UN 1511	102	Urea hydrogen peroxide
NA 1511	101	Urea peroxide
UN 1512	101	Zinc ammonium nitrite
UN 1513	101	Zinc chlorate
UN 1514	101	Zinc nitrate
UN 1515	101	Zinc permanganate
UN 1516	101	Zinc peroxide
UN 1517	101	Zirconium picramate, wet
UN 1517	102	Zirconium picramate, wetted
UN 1541	101	Acetone cyanohydrin
UN 1544	102	Alkaloids, n.o.s. *or* Alkaloid salts, n.o.s.
UN 1545	102	Allyl isothiocyanate
UN 1546	102	Ammonium arsenate
UN 1546	101	Ammonium arsenate, solid
UN 1547	102	Aniline
UN 1547	101	Aniline oil, liquid
UN 1548	102	Aniline hydrochloride
UN 1549	102	Antimony compounds, inorganic, n.o.s.
NA 1549	101	Antimony tribromide, solid
NA 1549	101	Antimony tribromide solution
NA 1549	101	Antimony trifluoride, solid
NA 1549	101	Antimony trifluoride solution
UN 1550	102	Antimony lactate
UN 1550	101	Antimony lactate, solid
UN 1551	102	Antimony potassium tartrate
UN 1551	101	Antimony potassium tartrate, solid
UN 1553	102	Arsenic acid, liquid
UN 1553	101	Arsenic acid solution
UN 1554	101	Arsenic acid, solid
UN 1555	102	Arsenic bromide
UN 1555	101	Arsenic bromide, solid

(1)—Identification Number	(2)—Source 172.***	(3)—Description
UN 1556	101	Arsenical compound, liquid, n.o.s., *or* Arsenical mixture, liquid, n.o.s.
UN 1556	102	Arsenic compounds, liquid, n.o.s.
NA 1556	101	Methyldichloroarsine
NA 1556	101	Phenyldichloroarsine
UN 1557	101	Arsenical compound, solid, n.o.s., *or* Arsenical mixture, solid, n.o.s.
NA 1557	101	Arsenical dip, liquid
UN 1557	102	Arsenic compounds, solid, n.o.s.
NA 1557	101	Arsenic iodide, solid
NA 1557	101	Arsenic sulfide, solid
NA 1557	101	Arsenic trisulfide
UN 1558	102	Arsenic
UN 1558	101	Arsenic, solid
UN 1559	102	Arsenic pentoxide
UN 1559	101	Arsenic pentoxide, solid
UN 1560	102	Arsenic trichloride
UN 1560	101	Arsenic trichloride, liquid
UN 1561	102	Arsenic trioxide
UN 1561	101	Arsenic trioxide, solid
UN 1562	101	Arsenical dust
UN 1564	102	Barium compounds, n.o.s.
UN 1565	102	Barium cyanide
UN 1565	101	Barium cyanide, solid
NA 1566	101	Beryllium chloride
UN 1566	101	Beryllium compound, n.o.s.
UN 1566	102	Beryllium compounds
NA 1566	101	Beryllium fluoride
UN 1567	102	Beryllium
UN 1569	102	Bromoacetone
UN 1569	101	Bromoacetone, liquid
UN 1570	102	Brucine
UN 1570	101	Brucine, solid
UN 1571	101	Barium azide, wet
UN 1571	102	Barium azide, wetted
UN 1572	102	Cacodylic acid
UN 1573	102	Calcium arsenate
UN 1573	101	Calcium arsenate, solid
UN 1574	102	Calcium arsenate and arsenite
NA 1574	101	Calcium arsenite, solid
UN 1575	102	Calcium cyanide
UN 1575	101	Calcium cyanide, solid *or* Calcium cyanide mixture, solid
UN 1577	102	Chlorodinitrobenzene
UN 1577	101	Dinitrochlorobenzene
UN 1578	102	Chloronitrobenzenes
UN 1578	101	Nitrochlorobenzene, meta *or* para, solid
UN 1578	101	Nitrochlorobenzene, ortho, liquid
UN 1579	101	4-Chloro-o-toluidine hydrochloride
UN 1580	102	Chloropicrin
UN 1580	101	Chloropicrin, liquid
UN 1581	102	Chloropicrin and methyl bromide
NA 1581	101	Methyl bromide and more than 2% chloropicrin mixture, liquid
UN 1582	102	Chloropicrin and methyl chloride
UN 1582	101	Chloropicrin and methyl chloride mixture
NA 1583	101	Chloropicrin, absorbed
UN 1583	101	Chloropicrin mixture
UN 1583	102	Chloropicrin mixtures, n.o.s.
UN 1584	102	Cocculus
UN 1584	101	Cocculus, solid
UN 1585	102	Copper acetoarsenite
UN 1585	101	Copper acetoarsenite, solid
UN 1586	102	Copper arsenite
UN 1586	101	Copper arsenite, solid
UN 1587	101	Copper cyanide
UN 1588	101	Cyanide *or* cyanide mixture, dry
UN 1588	102	Cyanides, inorganic, n.o.s.
UN 1589	101	Cyanogen chloride
UN 1590	102	Dichloroanilines
UN 1591	101	Dichlorobenzene, ortho, liquid
UN 1591	102	o-Dichlorobenzene
UN 1592	101	Dichlorobenzene, para, solid
UN 1592	102	p-Dichlorobenzene
UN 1593	102	Dichloromethane
UN 1593	101	Dichloromethane *or* Methylene chloride
UN 1594	102	Diethyl sulphate
UN 1595	101	Dimethyl sulfate
UN 1595	102	Dimethyl sulphate
UN 1596	102	Dinitroanilines
UN 1597	102	Dinitrobenzenes
UN 1597	101	Dinitrobenzene, solid, *or* Dinitrobenzol, solid
UN 1597	101	Dinitrobenzene solution
UN 1598	102	Dinitro-o-cresol
UN 1599	101	Dinitrophenol solution
UN 1599	102	Dinitrophenol, solution
UN 1600	101	Dinitrotoluene, liquid
UN 1600	102	Dinitrotoluenes, molten
UN 1601	101	Disinfectant, liquid
UN 1601	102	Disinfectants, n.o.s.
UN 1601	101	Disinfectant, solid
UN 1602	102	Dyes, n.o.s. *or* Dye intermediates, n.o.s.
UN 1603	102	Ethyl bromoacetate
UN 1604	101	Ethylenediamine
UN 1605	101	Ethylene dibromide
UN 1606	102	Ferric arsenate
UN 1606	101	Ferric arsenate, solid
UN 1607	102	Ferric arsenite
UN 1607	101	Ferric arsenite, solid
UN 1608	102	Ferrous arsenate
UN 1608	101	Ferrous arsenate, solid
UN 1610	102	Halogenated irritating liquids, n.o.s.
UN 1611	102	Hexaethyl tetraphosphate
UN 1611	101	Hexaethyl tetraphosphate, liquid
UN 1612	102	Hexaethyl tetraphosphate and compressed gas
UN 1612	101	Hexaethyl tetraphosphate and compressed gas mixture
UN 1613	102	Hydrocyanic acid, aqueous solutions
UN 1613	101	Hydrocyanic acid solution
UN 1613	101	Hydrocyanic acid solution, less than 5% hydrocyanic acid
UN 1614	102	Hydrogen cyanide, anhydrous, stabilized
UN 1616	101	Lead acetate
UN 1617	102	Lead arsenates
UN 1617	101	Lead arsenate, solid
UN 1618	102	Lead arsenites
UN 1618	101	Lead arsenite, solid
UN 1620	101	Lead cyanide
UN 1621	102	London purple
UN 1621	101	London purple, solid
UN 1622	102	Magnesium arsenate
UN 1622	101	Magnesium arsenate, solid
UN 1623	102	Mercuric arsenate
UN 1624	102	Mercuric chloride
UN 1624	101	Mercuric chloride, solid
UN 1625	101	Mercuric nitrate
UN 1626	102	Mercuric potassium cyanide
UN 1626	101	Mercuric potassium cyanide, solid
UN 1627	102	Mercurous nitrate
UN 1627	101	Mercurous nitrate, solid
UN 1628	101	Mercurous sulfate, solid
UN 1628	102	Mercurous sulphate
UN 1629	101	Mercuric acetate
UN 1629	101	Mercurous acetate, solid

(1)—Identification Number	(2)—Source 172.***	(3)—Description
UN 1629	102	Mercury acetate
UN 1630	101	Mercuric ammonium chloride, solid
UN 1630	102	Mercury ammonium chloride
UN 1631	101	Mercuric benzoate, solid
UN 1631	102	Mercury benzoate
UN 1633	102	Mercury bisulphate
UN 1634	101	Mercuric bromide, solid
UN 1634	101	Mercurous bromide, solid
UN 1634	102	Mercury bromides
UN 1636	101	Mercuric cyanide, solid
UN 1636	102	Mercury cyanide
UN 1637	101	Mercurous gluconate, solid
UN 1637	102	Mercury gluconate
UN 1638	101	Mercuric iodide, solid
UN 1638	101	Mercuric iodide, solution
UN 1638	101	Mercurous iodide, solid
UN 1638	102	Mercury iodide
UN 1639	101	Mercurol *or* Mercury nucleate, solid
UN 1639	102	Mercury nucleate
UN 1640	101	Mercuric oleate, solid
UN 1640	102	Mercury oleate
UN 1641	101	Mercuric oxide, solid
UN 1641	101	Mercurous oxide, black, solid
UN 1641	102	Mercury oxide
UN 1642	101	Mercuric oxycyanide, solid
UN 1642	102	Mercury oxycyanide
UN 1643	101	Mercuric potassium iodide, solid
UN 1643	102	Mercury potassium iodide
UN 1644	101	Mercuric salicylate solid
UN 1644	102	Mercury salicylate
UN 1645	101	Mercuric sulfate, solid
UN 1645	102	Mercuric sulphate
UN 1646	101	Mercuric sulfocyanate, solid *or* Mercuric thiocyanate, solid
UN 1646	102	Mercury thiocyanate
UN 1647	102	Methyl bromide and ethylene dibromide mixtures, liquid
UN 1647	101	Methyl bromide - ethylene dibromide mixture, liquid
NA 1648	101	Acetonitrile
UN 1648	102	Methyl cyanide
UN 1649	101	Motor fuel antiknock compound *or* Antiknock compound
UN 1649	102	Motor fuel anti-knock mixtures
NA 1649	101	Tetraethyl lead, liquid
UN 1650	102	Naphthylamine
UN 1651	102	alpha-Naphthylthiourea
UN 1652	102	Naphthylurea
UN 1653	102	Nickel cyanide
UN 1653	101	Nickel cyanide, solid
UN 1654	102	Nicotine
UN 1654	101	Nicotine, liquid
UN 1655	102	Nicotine compounds, n.o.s. *or* Nicotine preparations, n.o.s
UN 1656	101	Nicotine hydrochloride
UN 1656	102	Nicotine hydrochloride, *or* Nicotine hydrochloride solutions
UN 1657	101	Nicotine salicylate
UN 1658	101	Nicotine sulfate, liquid
UN 1658	101	Nicotine sulfate, solid
UN 1658	102	Nicotine sulphate, solid *or* solution
UN 1659	101	Nicotine tartrate
UN 1660	101	Nitric oxide
UN 1661	101	Nitroaniline
UN 1661	102	Nitroanilines
UN 1662	102	Nitrobenzene
UN 1662	101	Nitrobenzene, liquid *or* Nitrobenzol, liquid
UN 1663	101	Nitrophenol
UN 1663	102	Nitrophenols
UN 1664	101	Nitrotoluene
UN 1664	102	Nitrotoluenes
UN 1665	102	Nitroxylenes
NA 1665	101	Nitroxylol
UN 1669	102	Pentachloroethane
UN 1670	101	Perchloromethyl mercaptan
UN 1671	101	Phenol
UN 1672	102	Phenylcarbylamine chloride
UN 1673	101	Phenylenediamine, meta *or* para, solid
UN 1673	102	Phenylenediamines
UN 1674	102	Phenylmercuric acetate
UN 1677	102	Potassium arsenate
UN 1677	101	Potassium arsenate, solid
UN 1678	102	Potassium arsenite
UN 1678	101	Potassium arsenite, solid
UN 1679	102	Potassium cuprocyanide
UN 1680	102	Potassium cyanide
UN 1680	101	Potassium cyanide, solid
UN 1680	101	Potassium cyanide solution
UN 1681	102	Rodenticides, n.o.s
UN 1683	102	Silver arsenite
UN 1684	101	Silver cyanide
UN 1685	101	Sodium arsenate
UN 1686	102	Sodium arsenite, aqueous solutions
UN 1686	101	Sodium arsenite, liquid
UN 1687	101	Sodium azide
UN 1688	102	Sodium cacodylate
UN 1689	102	Sodium cyanide
UN 1689	101	Sodium cyanide, solid
UN 1689	101	Sodium cyanide solution
UN 1690	101	Sodium fluoride, solid
UN 1690	101	Sodium fluoride, solution
UN 1691	102	Strontium arsenite
UN 1691	101	Strontium arsenite, solid
UN 1692	102	Strychnine
UN 1692	101	Strychnine salt, solid
UN 1692	101	Strychnine, solid
NA 1693	101	Irritating agent, n.o.s.
NA 1693	101	ORM-A, n.o.s.
UN 1693	102	Tear gas
NA 1693	101	Tear gas device
UN 1694	102	Bromobenzyl cyanides
UN 1695	102	Chloroacetone
UN 1695	101	Monochloroacetone, stabilized *or* inhibited
UN 1697	102	Chloroacetophenone
UN 1697	101	Chloroacetophenone, gas, liquid, *or* solid
UN 1698	101	Diphenylaminechloroarsine
UN 1699	102	Diphenylchloroarsine
UN 1700	101	Tear gas candle
UN 1700	102	Tear gas candles
UN 1701	101	Xylyl bromide
UN 1702	102	1,1,2,2-Tetrachloroethane
UN 1702	101	Tetrachloroethane
UN 1703	101	Tetraethyl dithiopyrophosphate and compressed gas mixture
UN 1703	102	Tetraethyl dithiopyrophosphate with gases
UN 1704	101	Tetraethyl dithiopyrophosphate, liquid
UN 1704	102	Tetraethyl dithiopyrophosphate, liquid *or* mixtures
UN 1704	101	Tetraethyl dithiopyrophosphate mixture, dry
UN 1704	101	Tetraethyl dithiopyrophosphate mixture, liquid
UN 1705	102	Tetraethyl pyrophosphate and compressed gas
UN 1705	101	Tetraethyl pyrophosphate and compressed gas mixture

(1)—Identification Number	(2)—Source 172.***	(3)—Description
UN 1707	102	Thallium compounds, n.o.s.
NA 1707	101	Thallium salt, solid, n.o.s
NA 1707	101	Thallium sulfate, solid
UN 1708	102	Toluidines
UN 1709	102	2,4-Toluylenediamine
NA 1709	101	Toluenediamine
UN 1710	101	Trichloroethylene
UN 1711	102	Xylidines
UN 1712	101	Zinc arsenate
UN 1712	102	Zinc arsenate *or* Zinc arsenite, *or* mixtures
UN 1712	101	Zinc arsenite, solid
UN 1713	101	Zinc cyanide
UN 1714	101	Zinc phosphide
UN 1715	101	Acetic anhydride
UN 1716	101	Acetyl bromide
UN 1717	101	Acetyl chloride
UN 1718	101	Acid butyl phosphate
UN 1718	102	Butyl acid phosphate
NA 1719	101	Alkaline liquid, n.o.s
UN 1719	102	Caustic alkali liquids, n.o.s.
UN 1722	101	Allyl chlorocarbonate
UN 1722	102	Allyl chloroformate
UN 1723	102	Allyl iodide
UN 1724	101	Allyl trichlorosilane
UN 1725	102	Aluminium bromide, anhydrous
UN 1725	101	Aluminum bromide, anhydrous
UN 1726	102	Aluminium chloride, anhydrous
UN 1727	101	Ammonium hydrogen fluoride, solid
UN 1728	102	Amyl trichlorosilane
UN 1728	101	Amyl trichorosilane
UN 1729	101	Anisoyl chloride
UN 1730	101	Antimony pentachloride
UN 1731	102	Antimony pentachloride
UN 1731	101	Antimony pentachloride solution
UN 1732	101	Antimony pentafluoride
UN 1733	102	Antimony trichloride
UN 1733	101	Antimony trichloride, solid
UN 1733	101	Antimony trichloride solution
UN 1736	101	Benzoyl chloride
UN 1737	101	Benzyl bromide
UN 1738	101	Benzyl chloride
UN 1739	101	Benzyl chloroformate
UN 1740	102	Bifluorides, n.o.s.
UN 1741	101	Boron trichloride
UN 1742	102	Boron trifluoride acetic acid complex
UN 1742	101	Boron trifluoride-acetic acid complex
UN 1743	102	Boron trifluoride propionic acid complex
UN 1744	101	Bromine
UN 1745	101	Bromine pentafluoride
UN 1746	101	Bromine trifluoride
UN 1747	101	Butyl trichlorosilane
UN 1748	102	Calcium hypochlorite, dry *or* Calcium hypochlorite mixtures
UN 1748	101	Calcium hypochlorite mixture
UN 1749	101	Chlorine trifluoride
UN 1750	102	Chloroacetic acid
UN 1750	101	Chloroacetic acid, liquid *or* solution
UN 1751	101	Chloroacetic acid, solid
UN 1752	101	Chloroacetyl chloride
UN 1753	102	Chlorophenyl trichlorosilane
UN 1753	101	Chlorophenyltrichlorosilane
UN 1754	101	Chlorosulfonic acid
UN 1754	101	Chlorosulfonic acid-sulfur trioxide mixture
UN 1754	102	Chlorosulphonic acid
UN 1755	102	Chromic acid
UN 1755	101	Chromic acid solution
UN 1756	101	Chromic fluoride, solid
UN 1757	101	Chromic fluoride solution
UN 1757	102	Chromic fluoride, solution
UN 1758	102	Chromium oxychloride
UN 1758	101	Chromium oxychloride *or* Chromyl chloride
UN 1759	101	Corrosive solid, n.o.s.
UN 1759	102	Corrosive solids, n.o.s.
NA 1759	101	Cosmetics, solid, n.o.s.
NA 1759	101	Drugs, solid, n.o.s.
NA 1759	101	Ferrous chloride, solid
NA 1759	101	Stannous chloride, solid
NA 1760	101	2-(2-Aminoethoxy) ethanol
NA 1760	101	2,2-Dichloropropionic acid
NA 1760	101	Acid, liquid, n.o.s.
NA 1760	101	Aluminum phosphate solution
NA 1760	101	Aluminum sulfate solution
NA 1760	101	Aminopropyldiethanolamine
NA 1760	101	bis (Aminopropyl) piperazine
NA 1760	101	Boiler compound, liquid
NA 1760	101	Chemical kit
NA 1760	101	Compound, cleaning, liquid
NA 1760	101	Compound, rust preventing *or* Compound, rust removing
NA 1760	101	Compound, tree *or* weed killing, liquid
NA 1760	101	Compound, vulcanizing, liquid
UN 1760	101	Corrosive liquid, n.o.s.
UN 1760	102	Corrosive liquids, n.o.s.
NA 1760	101	Cosmetics, liquid, n.o.s.
NA 1760	101	Drugs, liquid, n.o.s.
NA 1760	101	Ethyl phosphonothioic dichloride, anhydrous
NA 1760	101	Ethyl phosphorodichloridate
NA 1760	101	Ferrous chloride, solution
NA 1760	101	Flame retardant compound liquid
NA 1760	101	Hexanoic acid
NA 1760	101	Isopentanoic acid
NA 1760	101	Memtetrahydro phthalic anhydride
NA 1760	101	Methyl phosphonothioic dichloride, anhydrous
NA 1760	101	Morpholine, aqueous, mixture
NA 1760	101	N-Aminopropylmorpholine
NA 1760	101	Nitric acid, 40% or less
NA 1760	101	ORM-B, n.o.s.
NA 1760	101	Paint *or* paint related material
NA 1760	101	Textile treating compound *or* mixture, liquid
NA 1760	101	Titanium sulfate solution
NA 1760	101	Valeric acid
NA 1760	101	Water treatment compounds, liquid
NA 1760	101	White acid
UN 1761	101	Cupriethylene-diamine solution
UN 1761	102	Cupriethylenediamine, solution
UN 1762	101	Cyclohexenyl trichlorosilane
UN 1763	101	Cyclohexyl trichlorosilane
UN 1764	101	Dichloroacetic acid
UN 1765	101	Dichloroacetyl chloride
UN 1766	102	Dichlorophenyl trichlorosilane
UN 1766	101	Dichlorophenyltrichlorosilane
UN 1767	101	Diethyl dichlorosilane
UN 1768	102	Difluorophosphoric acid
UN 1768	101	Difluorophosphoric acid, anhydrous
UN 1769	101	Diphenyl dichlorosilane
UN 1770	102	Diphenylmethyl bromide
UN 1770	101	Diphenyl methyl bromide, solid
UN 1770	101	Diphenyl methyl bromide solution
UN 1771	101	Dodecyl trichlorosilane
UN 1773	102	Ferric chloride, anhydrous
UN 1773	101	Ferric chloride, solid

(1)—Identification Number	(2)—Source 172.***	(3)—Description
UN 1774	101	Fire extinguisher charge containing sulfuric acid
UN 1774	102	Fire extinguisher charges
UN 1775	101	Fluoboric acid
UN 1776	102	Fluorophosphoric acid
UN 1776	101	Monofluorophosphoric acid, anhydrous
UN 1777	101	Fluorosulfonic acid *or* Fluosulfonic acid
UN 1777	102	Fluorosulphonic acid
UN 1778	102	Fluosilicic acid
NA 1778	101	Hydrofluorosilicic acid
UN 1779	101	Formic acid
UN 1779	101	Formic acid solution
UN 1780	101	Fumaryl chloride
UN 1781	102	Hexadecyl trichlorosilane
UN 1781	101	Hexadecyltrichlorosilane
UN 1782	101	Hexafluorophosphoric acid
UN 1783	101	Hexamethylenediamine, solution
UN 1784	102	Hexyl trichlorosilane
UN 1784	101	Hexyltrichlorosilane
UN 1786	102	Hydrofluoric acid and sulphuric acid mixtures
UN 1786	101	Hydrofluoric and sulfuric acid mixture
UN 1787	101	Hydriodic acid
UN 1787	102	Hydriodic acid, solution
UN 1788	101	Hydrobromic acid
UN 1788	101	Hydrobromic acid not more than 49% strength
UN 1788	102	Hydrobromic acid, solution
NA 1789	101	Compound, cleaning, liquid (containing hydrochloric (muriatic) acid)
UN 1789	101	Hydrochloric acid
NA 1789	101	Hydrochloric acid mixture
UN 1789	102	Hydrochloric acid, solution
UN 1789	101	Hydrochloric acid solution, inhibited
NA 1790	101	Compound, cleaning, liquid (containing hydrofluoric acid)
NA 1790	101	Etching acid, liquid, n.o.s.
UN 1790	101	Hydrofluoric acid solution
UN 1790	102	Hydrofluoric acid, solution
UN 1791	101	Hypochlorite solution
NA 1791	101	Hypochlorite solution containing not more than 7% available chlorine
UN 1791	102	Hypochlorite, solutions
UN 1792	101	Iodine monochloride
UN 1793	101	Isopropyl acid phosphate, solid
UN 1793	102	Isopropyl acid phosphate
NA 1794	101	Lead dross
UN 1794	101	Lead sulfate, solid
UN 1794	102	Lead sulphate
UN 1796	102	Nitrating acid, mixtures
UN 1796	101	Nitrating acid, mixture (with more than 50% nitric acid)
UN 1796	101	Nitrating acid, mixture (with not more than 50% nitric acid)
UN 1798	101	Nitrohydrochloric acid
UN 1798	101	Nitrohydrochloric acid, diluted
UN 1799	102	Nonyl trichlorosilane
UN 1799	101	Nonyltrichlorosilane
UN 1800	102	Octadecyl trichlorosilane
UN 1800	101	Octadecyltrichlorosilane
UN 1801	102	Octyl trichlorosilane
UN 1801	101	Octyltrichlorosilane
UN 1802	102	Perchloric acid
UN 1802	101	Perchloric acid, not over 50% acid
UN 1803	102	Phenolsulphonic acid
UN 1804	102	Phenyl trichlorosilane
UN 1804	101	Phenyltrichlorosilane
UN 1805	101	Phosphoric acid
UN 1806	102	Phosphorus pentachloride
UN 1806	101	Phosphorus pentachloride, solid
NA 1807	101	Phosphoric anhydride
UN 1807	102	Phosphorus pentoxide
UN 1808	101	Phosphorus tribromide
UN 1809	101	Phosphorus trichloride
UN 1810	101	Phosphorus oxychloride
UN 1811	102	Potassium bifluoride
NA 1811	101	Potassium hydrogen fluoride solution
UN 1812	101	Potassium fluoride
UN 1812	101	Potassium fluoride solution
NA 1813	101	Battery
UN 1813	101	Potassium hydroxide, dry solid, flake, bead, *or* granular
UN 1813	102	Potassium hydroxide, solid
UN 1814	101	Potassium hydroxide, liquid *or* solution
UN 1814	102	Potassium hydroxide, solution
UN 1815	102	Propionyl chloride
UN 1816	101	Propyl trichlorosilane
UN 1817	101	Pyrosulfuryl chloride
UN 1817	102	Pyrosulphuryl chloride
UN 1818	101	Silicon chloride *or* Silicon tetrachloride
UN 1818	102	Silicon tetrachloride
UN 1819	101	Sodium aluminate solution
UN 1819	102	Sodium aluminate, solution
UN 1821	101	Sodium hydrogen sulfate, solid
UN 1821	102	Sodium hydrogen sulphate, solid
UN 1823	101	Sodium hydroxide, dry solid, flake, bead, *or* granular
UN 1823	102	Sodium hydroxide, solid
UN 1824	101	Sodium hydroxide, liquid *or* solution
UN 1824	102	Sodium hydroxide, solution
UN 1825	102	Sodium monoxide
UN 1825	101	Sodium monoxide, solid
UN 1826	102	Acid mixtures, spent, nitrating
NA 1826	101	Nitrating acid, spent
UN 1827	102	Stannic chloride, anhydrous
UN 1827	101	Tin tetrachloride, anhydrous
UN 1828	101	Sulfur chloride
UN 1828	102	Sulphur chlorides
UN 1829	101	Sulfur trioxide
UN 1829	102	Sulphur trioxide
UN 1830	101	Sulfuric acid
UN 1830	102	Sulphuric acid
NA 1831	101	Oleum
UN 1831	102	Sulphuric acid, fuming
UN 1832	101	Sulfuric acid, spent
UN 1832	102	Sulphuric acid, spent
UN 1833	101	Sulfurous acid
UN 1833	102	Sulphurous acid
UN 1834	101	Sulfuryl chloride
UN 1834	102	Sulphuryl chloride
UN 1835	102	Tetramethylammonium hydroxide
UN 1835	101	Tetramethylammonium hydroxide, liquid
UN 1836	101	Thionyl chloride
UN 1837	101	Thiophosphoryl chloride
UN 1838	101	Titanium tetrachloride
UN 1839	101	Trichloroacetic acid, solid
UN 1840	101	Zinc chloride solution
UN 1840	102	Zinc chloride, solution
UN 1841	101	Acetaldehyde ammonia
UN 1843	102	Ammonium dinitro-o-cresolate
UN 1845	102	Carbon dioxide, solid
UN 1845	101	Carbon dioxide, solid, *or* Dry ice, *or* Carbonice
UN 1846	101	Carbon tetrachloride

(1)—Identification Number	(2)—Source 172.***	(3)—Description
UN 1847	102	Potassium sulphide, hydrated
UN 1848	101	Propionic acid
UN 1848	101	Propionic acid, solution
UN 1849	102	Sodium sulphide, hydrated
UN 1850	101	Eradicator, paint *or* grease, liquid
UN 1850	102	Eradicators
UN 1851	101	Medicines, liquid, n.o.s.
UN 1851	101	Medicines, n.o.s.
UN 1851	101	Medicines, solid, n.o.s.
UN 1854	102	Barium alloys, pyrophoric
UN 1855	102	Calcium, pyrophoric *or* Calcium alloys, pyrophoric
UN 1856	102	Rags
UN 1856	101	Rags, oily
UN 1857	101	Textile waste, wet
UN 1857	102	Textile waste, wet, n.o.s.
UN 1857	101	Waste textile, wet
UN 1858	101	Hexafluoropropylene
UN 1859	101	Silicon tetrafluoride
UN 1860	102	Vinyl fluoride
UN 1860	101	Vinyl fluoride, inhibited
UN 1862	101	Ethyl crotonate
UN 1863	102	Fuel, aviation
UN 1863	101	Fuel, aviation, turbine engine
UN 1864	102	Gas drips
UN 1864	101	Gas drips, hydrocarbon
UN 1865	102	n-Propyl nitrate
UN 1866	101	Resin solution
UN 1867	102	Cigarettes
UN 1867	101	Self-lighting cigarette
UN 1868	101	Decaborane
UN 1869	101	Magnesium, metal
UN 1869	102	Magnesium *or* Magnesium alloys
NA 1869	101	Magnesium scrap
UN 1870	102	Potassium borohydride
UN 1871	102	Titanium hydride
UN 1872	102	Lead dioxide
UN 1872	101	Lead peroxide
UN 1873	101	Perchloric acid
UN 1884	101	Barium oxide
UN 1885	101	Benzidine
UN 1886	102	Benzylidene chloride
UN 1887	101	Bromochloromethane
UN 1888	101	Chloroform
UN 1889	101	Cyanogen bromide
UN 1891	102	Ethyl bromide
UN 1892	102	Ethyl dichloroarsine
UN 1894	102	Phenylmercuric hydroxide
UN 1895	102	Phenylmercuric nitrate
UN 1896	102	Resin solution, poisonous
UN 1897	102	Tetrachloroethylene
UN 1897	101	Tetrachloroethylene *or* Perchloroethylene
UN 1898	101	Acetyl iodide
NA 1902	101	Di-(2-ethylhexyl) phosphoric acid
UN 1902	101	Diisooctyl acid phosphate
UN 1903	101	Disinfectant, liquid
UN 1903	102	Disinfectants, corrosive, liquid, n.o.s.
UN 1905	102	Selenic acid
UN 1905	101	Selenic acid, liquid
UN 1906	101	Acid, sludge
UN 1906	102	Sludge acid
UN 1907	102	Soda lime
UN 1907	101	Soda lime, solid
UN 1908	101	Sodium chlorite solution
UN 1908	102	Sodium chlorite, solution
UN 1910	101	Calcium oxide
UN 1911	102	Diborane
UN 1911	101	Diborane *or* diborane mixtures
UN 1912	102	Methyl chloride and methylene chloride, mixtures
UN 1912	101	Methyl chloride-methylene chloride mixture
UN 1913	101	Neon, refrigerated liquid
UN 1913	102	Neon, refrigerated liquid
UN 1914	102	Butyl propionate
UN 1915	102	Cyclohexanone
UN 1916	102	Dichloroethyl ether
UN 1917	102	Ethyl acrylate
UN 1917	101	Ethyl acrylate, inhibited
UN 1918	102	Isopropylbenzene
UN 1919	102	Methyl acrylate
UN 1919	101	Methyl acrylate, inhibited
UN 1920	102	Nonane
UN 1921	102	Propyleneimine
UN 1921	101	Propyleneimine, inhibited
UN 1922	101	Pyrrolidine
UN 1923	102	Calcium hydrosulphite
UN 1924	102	Ethyl aluminium dichloride
UN 1925	102	Ethyl aluminium sesquichloride
UN 1926	102	Methyl aluminium sesquibromide
UN 1927	102	Methyl aluminium sesquichloride
UN 1928	101	Methyl magnesium bromide in ethyl ether
UN 1928	102	Methyl magnesium bromide, in ethyl ether
UN 1929	102	Potassium hydrosulphite
UN 1930	102	Triisobutyl aluminium
UN 1931	101	Zinc hydrosulfite
UN 1931	102	Zinc hydrosulphite
UN 1932	102	Zirconium
UN 1932	101	Zirconium scrap
UN 1935	101	Cyanide solution, n.o.s.
UN 1935	102	Cyanide, solutions
UN 1938	102	Bromoacetic acid
UN 1938	101	Bromoacetic acid, solid
UN 1938	101	Bromoacetic acid solution
UN 1939	101	Phosphorus oxybromide
UN 1939	102	Phosphorus oxybromide, solid
UN 1940	101	Thioglycolic acid
UN 1941	101	Dibromodifluoromethane
UN 1942	102	Ammonium nitrate
UN 1942	101	Ammonium nitrate (no organic coating)
NA 1942	101	Ammonium nitrate (organic coating)
UN 1944	101	Matches, safety
UN 1945	102	Matches
UN 1950	102	Aerosol dispensers
UN 1951	101	Argon, refrigerated liquid
UN 1951	102	Argon, refrigerated liquid
UN 1952	102	Carbon dioxide and ethylene oxide mixtures
UN 1953	102	Compressed *or* liquefied gases, flammable, toxic, n.o.s.
NA 1953	101	Poisonous liquid *or* gas, flammable, n.o.s.
UN 1954	101	Compressed gas, n.o.s.
UN 1954	102	Compressed *or* liquefied gases, flammable
NA 1954	101	Refrigerant gas, n.o.s. *or* Dispersant gas, n.o.s.
NA 1954	101	Refrigerating machine
NA 1955	101	Chloropicrin and nonflammable, nonliquefied compressed gas mixture
UN 1955	102	Compressed *or* liquefied gases
NA 1955	101	Methyl bromide and nonflammable, nonliquefied compressed gas mixture, liquid

(1)—Identification Number	(2)—Source 172.***	(3)—Description
NA 1955	101	Organic phosphate, Organic phosphate compound, *or* Organic phosphorus compound, mixed with compressed gas
NA 1955	101	Poisonous liquid *or* gas, n.o.s.
(UN 1955)	102	Tetrafluorohydrazine
NA 1956	101	Accumulator, pressurized
UN 1956	101	Compressed gas, n.o.s.
UN 1956	102	Compressed *or* liquefied gases
NA 1956	101	Hexafluoropropylene oxide
NA 1956	101	Mine rescue equipment containing carbon dioxide
NA 1956	101	Water pump system
UN 1957	102	Deuterium
UN 1958	102	Dichlorotetrafluoroethane
UN 1959	102	1,1-Difluoroethylene
UN 1960	101	Engine starting fluid
UN 1961	102	Ethane
NA 1961	101	Ethane-Propane mixture, refrigerated liquid
UN 1961	101	Ethane, refrigerated liquid
UN 1962	102	Ethylene
UN 1962	101	Ethylene *or* Ethylene, compressed
UN 1963	101	Helium, refrigerated liquid
UN 1963	102	Helium, refrigerated liquid
UN 1964	102	Hydrocarbon gases, compressed, n.o.s. *or* Hydrocarbon gases, mixtures, compressed, n.o.s.
UN 1964	101	Hydrocarbon gas, nonliquefied
UN 1965	102	Hydrocarbon gases, liquefied, n.o.s. *or* Hydrocarbon gases, mixtures, liquefied, n.o.s.
UN 1965	101	Hydrocarbon gas, liquefied
UN 1966	102	Hydrogen
UN 1966	101	Hydrogen, refrigerated liquid
UN 1967	102	Insecticide gases
NA 1967	101	Insecticide, liquefied gas, containing Poison A material *or* Poison B material
NA 1967	101	Parathion and compressed gas mixture
UN 1968	102	Insecticide gases
NA 1968	101	Insecticide, liquefied gas
UN 1969	102	Isobutane *or* Isobutane mixtures
UN 1970	102	Krypton, refrigerated liquid
UN 1971	101	Methane *or* Methane, compressed
UN 1971	102	Methane *or* Natural gases
UN 1972	102	Methane *or* Natural gases
UN 1972	101	Methane, refrigerated liquid
UN 1972	101	Natural gas, refrigerated liquid
UN 1973	102	Chlorodifluoromethane and chloropentafluoroethane
UN 1974	102	Chlorodifluorobromomethane
UN 1975	102	Nitric oxide and nitrogen tetroxide mixtures
UN 1976	102	Octafluorocyclobutane
UN 1977	101	Nitrogen, refrigerated liquid
UN 1977	102	Nitrogen, refrigerated liquid
UN 1978	102	Propane
UN 1979	102	Rare gases
NA 1980	101	Helium-oxygen mixture
UN 1980	102	Rare gases
UN 1981	102	Rare gases
UN 1982	102	Tetrafluoromethane
UN 1983	102	Chlorotrifluoroethane
UN 1984	102	Trifluoromethane
UN 1986	102	Alcohols, toxic, n.o.s.
NA 1986	101	Denatured alcohol
NA 1986	101	Propargyl alcohol
NA 1986	101	Rum, denatured
UN 1987	101	Alcohol, n.o.s.
UN 1987	102	Alcohols, n.o.s.
UN 1988	102	Aldehydes, toxic, n.o.s.
UN 1989	102	Aldehydes, n.o.s.
NA 1989	101	Benzaldehyde
UN 1991	101	Chloroprene, inhibited
UN 1992	101	Flammable liquid, poisonous, n.o.s.
UN 1992	102	Flammable liquids, poisonous, n.o.s.
NA 1993	101	Combustible liquid, n.o.s.
NA 1993	101	Compound, cleaning, liquid
NA 1993	101	Compound, tree *or* weed killing, liquid
NA 1993	101	Cosmetics, n.o.s.
NA 1993	101	Creosote, coal tar
NA 1993	101	Disinfectant, liquid, n.o.s.
NA 1993	101	Drugs, n.o.s.
NA 1993	101	Ethyl nitrate
UN 1993	101	Flammable liquid, n.o.s.
UN 1993	102	Flammable liquids, n.o.s.
NA 1993	101	Fuel oil
NA 1993	101	Fuel oil, No. 1, 2, 4, 5 *or* 6
NA 1993	101	Heater for refrigerator car, liquid fuel type
NA 1993	101	Insecticide, liquid, n.o.s.
NA 1993	101	Organic peroxide, liquid *or* solution, n.o.s.
NA 1993	101	Plastic solvent, n.o.s.
NA 1993	101	Refrigerating machine
NA 1993	101	Solvent, n.o.s.
NA 1993	101	Wax, liquid
UN 1994	102	Iron pentacarbonyl
NA 1999	101	Asphalt
NA 1999	101	Asphalt, cut back
UN 1999	102	Cut-backs
UN 1999	101	Tar, liquid
UN 2000	102	Celluloid
UN 2001	102	Cobalt naphthenates
UN 2002	102	Celluloid, scrap
UN 2003	102	Metal alkyls, n.o.s.
UN 2004	102	Magnesium diamide
UN 2005	102	Magnesium diphenyl
UN 2006	102	Plastics, nitrocellulose-based, spontaneously combustible, n.o.s.
UN 2008	102	Zirconium
UN 2008	101	Zirconium metal, dry
UN 2009	102	Zirconium
UN 2010	102	Magnesium hydride
UN 2011	102	Magnesium phosphide
UN 2012	102	Potassium phosphide
UN 2013	102	Strontium phosphide
UN 2014	102	Hydrogen peroxide, aqueous solutions
UN 2014	101	Hydrogen peroxide solution (8% to 40% peroxide)
UN 2014	101	Hydrogen peroxide solution (40% to 52% peroxide)
UN 2015	101	Hydrogen peroxide solution (over 52% peroxide)
UN 2015	102	Hydrogen peroxide, stabilized, *or* Hydrogen peroxide, aqueous solutions, stabilized
UN 2016	102	Ammunition
UN 2016	101	Chemical ammunition, nonexplosive
NA 2016	101	Grenade
UN 2017	102	Ammunition, tear producing, nonexplosive
UN 2017	101	Chemical ammunition, nonexplosive
NA 2017	101	Grenade, tear gas
UN 2018	102	Chloroanilines
UN 2019	102	Chloroanilines
UN 2020	102	Chlorophenols, solid

(1)—Identification Number	(2)—Source 172.***	(3)—Description
NA 2020	101	Pentachlorophenol
NA 2020	101	Trichlorophenol
UN 2021	102	Chlorophenols, liquid
UN 2022	102	Cresylic acid
NA 2022	101	Mining reagent, liquid
UN 2023	101	Epichlorohydrin
UN 2024	102	Mercury compounds, liquid, n.o.s.
NA 2025	101	Mercuric subsulfate, solid
UN 2025	101	Mercury compound, solid, n.o.s.
UN 2025	102	Mercury compounds, solid, n.o.s.
UN 2026	102	Phenylmercuric compounds, n.o.s.
UN 2027	102	Sodium arsenite, solid
UN 2028	102	Bombs, smoke
UN 2029	101	Hydrazine, anhydrous
UN 2029	102	Hydrazine, anhydrous *or* Hydrazine aqueous solutions
UN 2030	101	Hydrazine, aqueous solution
UN 2030	102	Hydrazine hydrate *or* Hydrazine aqueous solutions
UN 2031	101	Nitric acid
UN 2032	101	Nitric acid, fuming
UN 2032	102	Nitric acid, red fuming
UN 2033	102	Potassium oxide
UN 2034	102	Hydrogen and methane mixtures, compressed
UN 2035	102	Trifluoroethane
UN 2036	101	Xenon
UN 2037	102	Receptacles
UN 2038	101	Dinitrotoluene, solid
UN 2038	102	Dinitrotoluenes, solid
UN 2044	102	2,2-Dimethylpropane
UN 2045	102	Isobutyraldehyde
UN 2046	102	Cymenes
UN 2047	101	Dichloropropene
NA 2047	101	Dichloropropene and propylene dichloride mixture
UN 2048	102	Dicyclopentadiene
UN 2049	102	Diethylbenzene
UN 2050	102	Diisobutylene
UN 2051	102	Dimethylethanolamine
UN 2052	102	Dipentene
UN 2053	102	Methyl isobutyl carbinol
UN 2054	101	Morpholine
NA 2054	101	Morpholine, aqueous, mixture
UN 2055	101	Styrene monomer, inhibited
UN 2056	101	Tetrahydrofuran
UN 2057	102	Tripropylene
UN 2058	102	Valeraldehyde
UN 2059	101	Box toe gum
NA 2059	101	Collodion
UN 2059	102	Nitrocellulose
NA 2059	101	Nitrocellulose, colloided, granular *or* flake, wet with not less than 20% alcohol *or* solvent, *or* block, wet with not less than 25% alcohol
NA 2059	101	Pyroxylin solution
NA 2059	101	Pyroxylin solvent, n.o.s.
UN 2060	101	Box toe gum
UN 2067	101	Ammonium nitrate fertilizer
UN 2067	102	Ammonium nitrate fertilizers
UN 2068	101	Ammonium nitrate-carbonate mixture
UN 2069	101	Ammonium nitrate mixed fertilizer
UN 2070	101	Ammonium nitrate-phosphate
UN 2071	102	Ammonium nitrate fertilizers
UN 2072	102	Ammonium nitrate fertilizers, n.o.s.
UN 2073	101	Ammonia solution
UN 2073	102	Ammonia solutions
UN 2074	102	Acrylamide
UN 2075	102	Chloral
UN 2076	101	Cresol
UN 2076	102	Cresols
UN 2077	102	Naphthylamine
UN 2078	101	Toluene diisocyanate
UN 2079	102	Diethylenetriamine
UN 2080	101	Acetyl acetone peroxide
UN 2081	101	Acetyl benzoyl peroxide
UN 2081	101	Acetyl benzoyl peroxide solution
UN 2082	101	Acetyl cyclohexanesulphonyl peroxide
UN 2082	102	Acetyl cyclohexane sulphonyl peroxide
UN 2083	101	Acetyl cyclohexanesulphonyl peroxide
UN 2083	102	Acetyl cyclohexane sulphonyl peroxide
UN 2084	101	Acetyl peroxide
UN 2084	101	Acetyl peroxide solution
NA 2085	101	Benzoyl peroxide
UN 2085	101	Benzoyl peroxide
UN 2086	102	Benzoyl peroxide
UN 2087	101	Benzoyl peroxide
UN 2088	101	Benzoyl peroxide
UN 2089	101	Benzoyl peroxide
UN 2090	101	Benzoyl peroxide
UN 2091	101	tert-Butyl cumyl peroxide
NA 2091	101	tert-Butyl isopropyl benzene hydroperoxide
UN 2092	101	tert-Butyl hydroperoxide
UN 2093	101	tert-Butyl hydroperoxide
UN 2094	101	tert-Butyl hydroperoxide
UN 2095	101	tert-Butyl peroxyacetate
UN 2096	101	tert-Butyl peroxyacetate
UN 2097	101	tert-Butyl peroxybenzoate
UN 2098	101	tert-Butyl peroxybenzoate
UN 2099	102	tert-Butyl monoperoxymaleate
UN 2099	101	tert-Butyl peroxymaleate
UN 2100	102	tert-Butyl monoperoxymaleate
UN 2100	101	tert-Butyl peroxymaleate
UN 2101	102	tert-Butyl monoperoxymaleate
UN 2101	101	tert-Butyl peroxymaleate
UN 2102	101	Di-tert-butyl peroxide
UN 2103	101	tert-Butyl peroxyisopropyl carbonate
UN 2103	102	tert-Butyl peroxy isopropyl carbonate
UN 2104	102	tert-Butyl peroxy-3,5,5-trimethyl hexanoate
UN 2104	101	tert-Butyl peroxy-3,5,5-trimethylhexanoate *or* tert-Butyl peroxyisononanoate
UN 2105	102	tert-Butyl monoperoxyphthalate
UN 2105	101	tert-Butyl peroxyphthalate
UN 2106	101	Di-(tert-butylperoxy)phthalate
UN 2107	101	Di-(tert-butylperoxy)phthalate
UN 2108	101	Di-(tert-butylperoxy)phthalate
UN 2110	101	tert-Butyl peroxypivalate
UN 2111	101	2,2-Di-(tert-butylperoxy)butane
UN 2111	102	2,2-Di-(tert-butylperoxy) butane
UN 2112	101	1,3-Di-(2-tert-butylperoxyisopropyl) benzene
UN 2112	101	1,3-Di-(2-tert-butylperoxyisopropyl) benzene and 1,4-Di-(2-tert-butylperoxyisopropyl) benzene mixture
UN 2112	101	1,4-Di-(2-tert-butylperoxyisopropyl) benzene
UN 2112	102	1,4-Di-(2 tert-butylperoxy isopropyl) benzene, *or* 1,3-di-(2-tert-butylperoxy isopropyl) benzene, *or* mixtures
UN 2113	102	Di-(4-chlorobenzoyl) peroxide
UN 2113	101	p-Chlorobenzoyl peroxide
UN 2114	102	Di-(4-chlorobenzoyl) peroxide

(1)—Identification Number	(2)—Source 172.***	(3)—Description
UN 2114	101	p-Chlorobenzoyl peroxide
UN 2115	102	Di-(4-chlorobenzoyl) peroxide
UN 2115	101	p-Chlorobenzoyl peroxide
UN 2116	101	Cumene hydroperoxide
UN 2116	102	Cumyl hydroperoxide
UN 2117	102	Cyclohexanone peroxides
UN 2118	101	Cyclohexanone peroxide
UN 2118	102	Cyclohexanone peroxides
UN 2119	101	Cyclohexanone peroxide
UN 2119	102	Cyclohexanone peroxides
UN 2120	101	Decanoyl peroxide
UN 2120	102	Didecanoyl peroxide
NA 2121	101	Dicumyl peroxide
UN 2121	101	Dicumyl peroxide
UN 2121	101	Dicumyl peroxide, dry
UN 2122	101	Di-(2-ethylhexyl) peroxydicarbonate
UN 2123	101	Di-(2-ethylhexyl) peroxydicarbonate
UN 2124	102	Dilauroyl peroxide
UN 2124	101	Lauroyl peroxide
UN 2125	101	Paramenthane hydroperoxide
UN 2125	101	p-Menthane hydroperoxide
UN 2126	102	Isobutyl methyl ketone peroxide
UN 2126	101	Methyl isobutyl ketone peroxide
UN 2127	102	Ethyl methyl ketone peroxide(s)
UN 2128	102	Di-(3,5,5-trimethylhexanoyl)peroxide
UN 2128	101	Isononanyl peroxide
NA 2129	101	Caprylyl peroxide solution
UN 2129	102	Di-n-octanoyl peroxide
UN 2129	101	n-Octanoyl peroxide
UN 2130	102	Di-n-nonanoyl peroxide
UN 2130	101	Pelargonyl peroxide
NA 2131	101	Peracetic acid solution
UN 2131	101	Peroxyacetic acid
UN 2132	102	Dipropionyl peroxide
UN 2132	101	Propionyl peroxide
UN 2133	102	Diisopropyl peroxydicarbonate
NA 2133	101	Isopropyl percarbonate, unstabilized
UN 2133	101	Isopropyl peroxydicarbonate
UN 2134	102	Diisopropyl peroxydicarcbonate
NA 2134	101	Isopropyl percarbonate, stabilized
UN 2134	101	Isopropyl peroxydicarbonate
UN 2135	102	Disuccinic acid peroxide
UN 2135	101	Succinic acid peroxide
UN 2136	101	Tetralin hydroperoxide
UN 2137	101	2,4-Dichlorobenzoyl peroxide
UN 2137	102	Di-2,4-dichlorobenzoyl peroxide
UN 2138	101	2,4-Dichlorobenzoyl peroxide
UN 2138	102	Di-2,4-dichlorobenzoyl peroxide
UN 2139	101	2,4-Dichlorobenzoyl peroxide
UN 2139	102	Di-2,4-dichlorobenzoyl peroxide
UN 2140	101	n-Butyl-4,4-di-(tert-butylperoxy)valerate
UN 2140	102	n-Butyl-4,4-di-(tert-butyl-peroxy) valerate
UN 2141	101	n-Butyl-4,4-di-(tert-butylperoxy)valerate
UN 2141	102	n-Butyl-4,4-di-(tert-butyl-peroxy) valerate
UN 2142	101	tert-Butyl peroxyisobutyrate
UN 2143	101	tert-Butyl peroxy-2-ethylhexanoate
UN 2143	102	tert-Butyl peroxy-2-ethyl hexanoate
UN 2144	101	tert-Butyl peroxydiethylacetate
UN 2145	101	1,1-Di-(tert-butylperoxy)-3,3,5-trimethyl cyclohexane
UN 2146	101	1,1-Di-(tert-butylperoxy)-3,3,5-trimethyl cyclohexane
UN 2147	101	1,1-Di-(tert-butylperoxy)-3,3,5-trimethyl cyclohexane
UN 2148	102	Di-(1-hydroxy cyclohexyl) peroxide
UN 2148	101	Di-(1-hydroxycyclohexyl) peroxide
UN 2149	101	Dibenzyl peroxydicarbonate
UN 2150	101	Di-sec-butyl peroxydicarbonate
UN 2151	101	Di-sec-butyl peroxydicarbonate
UN 2152	101	Dicyclohexyl peroxydicarbonate
UN 2153	101	Dicyclohexyl peroxydicarbonate
UN 2154	101	Di-(4-tert-butylcyclohexyl)peroxydicarbonate
UN 2154	102	Di-(4-tert-butylcyclohexyl) peroxydicarbonate
UN 2155	101	2,5-Dimethyl-2,5-di-(tert-butylperoxy)hexane
UN 2156	101	2,5-Dimethyl-2,5-di-(tert-butylperoxy)hexane
UN 2157	102	2,5-Dimethyl-2,5-di-(2-ethylhexanoylperoxy) hexane
UN 2157	101	2,5-Dimethyl-2,5-di-(2-ethylhexanoylperoxy)hexane
UN 2158	101	2,5-Dimethyl-2,5-di-(tert-butylperoxy)hexyne-3
UN 2159	101	2,5-Dimethyl-2,5-di-(tert-butylperoxy)hexyne-3
UN 2160	101	1,1,3,3-Tetramethylbutyl hydroperoxide
UN 2160	102	1,1,3,3-Tetramethyl butyl hydroperoxide
UN 2161	102	1,1,3,3-Tetramethyl butyl peroxy-2-ethyl hexanoate
UN 2161	101	1,1,3,3-Tetramethylbutyl peroxy-2-ethylhexanoate
UN 2162	101	Pinane hydroperoxide
UN 2162	101	Pinane hydroperoxide solution
UN 2162	102	Pinanyl hydroperoxide
UN 2163	101	Diacetone alcohol peroxide
UN 2163	102	Diacetone alcohol peroxides
UN 2164	101	Dicetyl peroxydicarbonate
UN 2165	101	3,3,6,6,9,9-Hexamethyl-1,2,4,5-tetraoxocyclononane
UN 2166	101	3,3,6,6,9,9-Hexamethyl-1,2,4,5-tetraoxocyclononane
UN 2167	101	3,3,6,6,9,9-Hexamethyl-1,2,4,5-tetraoxocyclononane
UN 2168	101	2,2-Di-(4,4-di-tert-butylperoxycyclohexyl)propane
UN 2169	101	n-Butyl peroxydicarbonate
UN 2170	101	n-Butyl peroxydicarbonate
UN 2171	101	Diisopropylbenzene hydroperoxide
UN 2171	101	Diisopropylbenzene hydroperoxide solution
UN 2172	101	2,5-Dimethyl-2,5-di-(benzoylperoxy)hexane
UN 2173	101	2,5-Dimethyl-2,5-di-(benzoylperoxy)hexane
UN 2174	101	2,5-Dimethyl-2,5-dihydroperoxy hexane
UN 2174	101	Dimethylhexane dihydroperoxide, (with 18% or more water)
UN 2175	101	Diethyl peroxydicarbonate
UN 2176	101	Di-n-propyl peroxydicarbonate
UN 2177	101	tert-Butyl peroxyneodecanoate
UN 2178	101	2,2-Dihydroperoxy propane
UN 2179	101	1,1-Di-(tert-butylperoxy)cyclohexane
UN 2179	102	1,1-Di-(tert-butylperoxy) cyclohexane
UN 2180	101	1,1-Di-(tert-butylperoxy)cyclohexane
UN 2180	102	1,1-Di-(tert-butylperoxy) cyclohexane
UN 2181	101	1,2-Di-(tert-butylperoxy)cyclohexane
UN 2182	101	Diisobutyryl peroxide
UN 2182	102	Isobutyryl peroxide
UN 2183	101	tert-Butyl peroxycrotonate
UN 2184	101	Ethyl 3,3-di-(tert-butylperoxy)butyrate

(1)—Identification Number	(2)—Source 172 ***	(3)—Description
UN 2184	102	Ethyl 3,3-di-(tert-butylperoxy) butyrate
UN 2185	101	Ethyl-3,3-di-(tert-butylperoxy)butyrate
UN 2185	102	Ethyl-3,3-di-(tert-butylperoxy) butyrate
UN 2186	101	Hydrogen chloride, refrigerated liquid
UN 2187	101	Carbon dioxide, refrigerated liquid
UN 2187	102	Carbon dioxide, refrigerated liquid
UN 2188	101	Arsine
UN 2189	102	Dichlorosilane
UN 2190	102	Oxygen difluoride
UN 2191	101	Sulfuryl fluoride
UN 2191	102	Sulphuryl fluoride
UN 2192	101	Germane
UN 2193	102	Hexafluoroethane
UN 2194	102	Selenium hexafluoride
UN 2195	102	Tellurium hexafluoride
UN 2196	101	Tungsten hexafluoride
UN 2197	102	Hydrogen iodide, anhydrous
UN 2198	102	Phosphorus pentafluoride
UN 2199	101	Phosphine
UN 2200	102	Propadiene, inhibited
UN 2201	101	Nitrous oxide, refrigerated liquid
UN 2201	102	Nitrous oxide, refrigerated liquid
UN 2202	101	Hydrogen selenide
UN 2203	102	Silane
UN 2204	102	Carbonyl sulfide
UN 2205	102	Adiponitrile
UN 2206	102	Isocyanates, n.o.s. *or* Isocyanate solutions, n.o.s.
UN 2207	102	Isocyanates, n.o.s. *or* Isocyanate solutions, n.o.s.
UN 2208	101	Bleaching powder
UN 2208	102	Calcium hypochlorite mixtures, dry
UN 2209	101	Formaldehyde solution
UN 2209	102	Formaldehyde, solutions
UN 2210	102	Maneb, *or* maneb preparation(s)
NA 2210	101	Pesticide, water reactive
UN 2211	102	Plastics moulding materials evolving flammable vapours
UN 2212	102	Asbestos, blue
UN 2213	101	Paraformaldehyde
UN 2214	102	Phthalic anhydride
NA 2215	101	Maleic acid
UN 2215	101	Maleic anhydride
UN 2216	102	Fishmeal *or* fishscrap
NA 2216	101	Fish meal *or* fish scrap containing 5% to 12% water
UN 2217	102	Seed cake
UN 2218	101	Acrylic acid
UN 2218	102	Acrylic acid, inhibited
UN 2219	102	Allyl glycidyl ether
UN 2220	102	Aluminium alkyl halides
UN 2221	102	Aluminium alkyl halides
UN 2222	102	Anisole
UN 2224	101	Benzonitrile
UN 2225	102	Benzene sulphonyl chloride
UN 2226	102	Benzotrichloride
UN 2227	102	n-Butyl methacrylate
UN 2228	102	Butylphenols, liquid
UN 2229	102	Butylphenols, solid
UN 2232	102	Chloroacetaldehyde
UN 2233	102	p-Chloro-o-anisidine
UN 2234	102	Chlorobenzotrifluorides
UN 2235	102	p-Chlorobenzyl chloride
UN 2236	102	3-Chloro-4-methylphenyl isocyanate
UN 2237	102	Chloronitroanilines
UN 2238	102	Chlorotoluenes
UN 2239	102	Chlorotoluidines
UN 2240	102	Chromosulphuric acid
UN 2241	102	Cycloheptane
UN 2242	102	Cycloheptene
UN 2243	102	Cyclohexyl acetate
UN 2244	102	Cyclopentanol
UN 2245	102	Cyclopentanone
UN 2246	102	Cyclopentene
UN 2247	102	n-Decane
UN 2248	102	Di-(n-butyl)amine
UN 2249	102	Dichlorodimethyl ether, symmetrical
UN 2250	102	Dichlorophenyl isocyanates
UN 2252	102	1,2-Dimethoxyethane
UN 2253	102	N,N-Dimethylaniline
UN 2254	102	Matches
UN 2255	101	Organic peroxide sample, n.o.s.
UN 2255	102	Organic peroxides, n.o.s., samples
UN 2256	102	Cyclohexene
UN 2257	102	Potassium metal
UN 2257	101	Potassium, metal *or* metallic
UN 2258	101	Propylenediamine
UN 2259	102	Triethylenetetramine
UN 2260	102	Tripropylamine
UN 2261	101	Xylenol
UN 2261	102	Xylenols
UN 2262	102	N,N-Dimethylcarbamoyl chloride
UN 2263	101	1,4-Dimethylcyclohexane
UN 2263	102	Dimethylcyclohexanes
UN 2264	102	N,N-Dimethylcyclohexylamine
UN 2265	102	N,N-Dimethylformamide
UN 2266	102	Dimethyl-N-propylamine
UN 2267	102	Dimethyl thiophosphoryl chloride
UN 2269	102	3,3'-Iminobispropylamine
UN 2269	101	Iminobispropylamine
UN 2270	102	Ethylamine solution
UN 2271	102	Ethyl amyl ketone
UN 2272	102	N-Ethylaniline
UN 2273	102	2-Ethylaniline
UN 2274	102	N-Ethyl-n-benzylaniline
UN 2275	102	2-Ethylbutanol
UN 2276	102	2-Ethylhexylamine
UN 2277	102	Ethyl methacrylate, inhibited
UN 2278	102	n-Heptene
UN 2279	102	Hexachlorobutadiene
UN 2280	101	Hexamethylenediamine, solid
UN 2281	102	Hexamethylenediisocyanate
UN 2282	102	Hexanols
UN 2283	102	Isobutyl methacrylate
UN 2284	102	Isobutyronitrile
UN 2285	102	Isocyanatobenzotrifluorides
UN 2286	102	Pentamethylheptane
UN 2287	102	Isoheptene
UN 2288	102	Isohexene
UN 2289	102	Isophoronediamine
UN 2290	102	Isophorone diisocyanate
NA 2291	101	Lead chloride
UN 2291	102	Lead compounds, soluble, n.o.s.
NA 2291	101	Lead fluoborate
NA 2291	101	Lead sulfate
NA 2291	101	Lead sulfide
NA 2291	101	Lead thiocyanate
UN 2293	102	4-Methoxy-4-methylpentan-2-one
UN 2294	102	N-Methylaniline
UN 2295	102	Methyl chloroacetate
UN 2296	102	Methyl cyclohexane
UN 2296	101	Methylcyclohexane
UN 2297	102	Methyl cyclohexanone
UN 2298	101	Cyclopentane, methyl
UN 2298	102	Methyl cyclopentane
UN 2298	101	Methylcyclopentane
UN 2299	101	Methyl dichloroacetate
UN 2300	102	2-Methyl-5 ethylpyridine

(1)—Identification Number	(2)—Source 172 ***	(3)—Description
UN 2300	101	Methyl ethyl pyridine
UN 2301	102	2-Methylfuran
UN 2301	101	Methylfuran
UN 2302	102	5-Methylhexan-2-one
UN 2303	102	Isopropenylbenzene
UN 2304	102	Napthalene, molten
UN 2305	102	Nitrobenzenesulphonic acid
UN 2306	102	Nitrobenzotrifluorides
UN 2307	102	3-Nitro-4-chlorobenzotrifluoride
UN 2308	102	Nitrosylsulphuric acid
UN 2309	102	Octadiene
UN 2310	102	2,4-Pentanedione
UN 2311	102	Phenetidines
UN 2312	102	Phenol, molten
UN 2313	102	Picolines
UN 2315	101	Polychlorinated biphenyls
UN 2316	102	Sodium cuprocyanide
UN 2317	102	Sodium cuprocyanide solution
UN 2318	101	Sodium hydrosulfide, solid
UN 2318	102	Sodium hydrosulphide
UN 2319	102	Terpene hydrocarbons n.o.s.
UN 2320	102	Tetraethylenepentamine
UN 2321	102	Trichlorobenzenes
UN 2322	102	Trichlorobutene
UN 2323	102	Triethyl phosphite
UN 2324	102	Triisobutylene
UN 2325	102	1,3,5-Trimethylbenzene
UN 2326	102	Trimethylcyclohexylamine
UN 2327	102	Trimethylhexamethylene diamines
UN 2328	102	Trimethylhexamethylene diisocyanate
UN 2329	102	Trimethyl phosphite
UN 2330	102	Undecane
UN 2331	102	Zinc chloride, anhydrous
UN 2331	101	Zinc chloride, solid
UN 2332	102	Acetaldehyde oxime
UN 2333	102	Allyl acetate
UN 2334	102	Allylamine
UN 2335	102	Allyl ethyl ether
UN 2336	102	Allyl formate
UN 2337	101	Phenyl mercaptan
UN 2338	102	Benzotrifluoride
UN 2339	102	2-Bromobutane
UN 2340	102	2-Bromoethyl ethyl ether
UN 2341	102	1-Bromo-3-methylbutane
UN 2342	102	Bromomethylpropanes
UN 2343	102	2-Bromopentane
UN 2344	102	Bromopropanes
UN 2345	102	3-Bromopropyne
UN 2346	102	Butanedione
UN 2346	101	Diacetyl
UN 2347	101	Butyl mercaptan
UN 2348	102	Butylacrylate, inhibited
UN 2350	102	Butyl methyl ether
UN 2351	102	Butyl nitrite
UN 2352	102	Butyl vinyl ether
UN 2353	102	Butyryl chloride
UN 2354	102	Chloromethyl ethyl ether
UN 2356	102	2-Chloropropane
UN 2357	101	Cyclohexylamine
UN 2358	102	Cyclooctatetraene
UN 2359	102	Diallylamine
UN 2360	102	Diallylether
UN 2361	102	Diisobutylamine
UN 2362	102	1,1-Dichloroethane
UN 2363	101	Ethyl mercaptan
UN 2364	102	Propyl benzene
UN 2366	102	Diethyl carbonate
UN 2367	102	alpha-Methyl valeraldehyde
UN 2368	102	alpha-Pinene
UN 2368	101	Pinene

(1)—Identification Number	(2)—Source 172 ***	(3)—Description
UN 2369	102	Ethylene glycol monobutyl ether
UN 2370	102	Hex-1-ene
UN 2371	102	Isopentenes
UN 2372	102	1,2-Di-(dimethylamino)-ethane
UN 2373	102	Diethoxymethane
UN 2374	102	3,3-Diethoxypropene
UN 2375	102	Diethyl sulfide
UN 2376	102	2,3-Dihydropyran
UN 2376	101	Dihydropyran
UN 2377	102	1,1-Dimethoxyethane
UN 2378	102	2-Dimethylaminoacetonitrile
UN 2379	102	1,3-Dimethylbutylamine
UN 2380	102	Dimethyldiethoxysilane
UN 2381	102	Dimethyl disulfide
UN 2382	102	Dimethylhydrazine
UN 2383	102	Dipropylamine
UN 2384	102	Dipropyl ether
UN 2385	102	Ethylisobutyrate
UN 2386	102	1-Ethyl piperidine
UN 2387	102	Fluorobenzene
UN 2388	102	Fluorotoluenes
UN 2389	101	Furan
UN 2390	102	2-Iodobutane
UN 2391	102	Iodomethylpropanes
UN 2392	102	Iodopropanes
UN 2393	102	Isobutyl formate
UN 2394	102	Isobutyl propionate
UN 2395	102	Isobutyryl chloride
UN 2396	102	Methacraldehyde
UN 2397	102	3-Methyl butan 2-one
UN 2398	102	Methyl-tert-butyl ether
UN 2399	102	1-Methylpiperidine
UN 2400	102	Methylisovalerate
UN 2401	102	Piperidine
UN 2402	102	Propanethiols
UN 2403	102	Isopropenyl acetate
UN 2404	102	Propionitrile
UN 2405	102	Isopropyl butyrate
UN 2406	102	Isopropyl isobutyrate
UN 2407	102	Isopropyl chloroformate
UN 2409	102	Isopropyl propionate
UN 2410	102	1,2,3,6-Tetrahydropyridine
UN 2411	102	Butyronitrile
UN 2412	102	Tetrahydrothiophene
UN 2413	102	Tetrapropylorthotitanate
UN 2414	102	Thiophene
UN 2416	102	Trimethyl borate
UN 2417	102	Carbonyl fluoride
UN 2418	102	Sulphur tetrafluoride
UN 2419	102	Bromotrifluoroethylene
UN 2420	102	Hexafluoroacetone
UN 2421	102	Nitrogen trioxide
UN 2422	102	Octafluorobut-2-ene
NA 2422	101	Perfluoro-2-butene
UN 2424	102	Octafluoropropane
UN 2426	101	Ammonium nitrate, solution
UN 2427	102	Potassium chlorate
UN 2428	102	Sodium chlorate
UN 2429	102	Calcium chlorate
UN 2430	102	Alkyl phenols, n.o.s.
UN 2431	102	o-Anisidine
UN 2432	102	N,N-Diethylaniline
UN 2433	102	Chloro-o-nitrotoluene
UN 2434	102	Dibenzyldichlorosilane
UN 2435	101	Ethyl phenyl dichlorosilane
UN 2435	102	Ethylphenyldichlorosilane
UN 2436	102	Thioacetic acid
UN 2437	102	Methylphenyldichlorosilane
UN 2438	101	Trimethylacetyl chloride
UN 2439	101	Sodium bifluoride, solid
UN 2439	101	Sodium bifluoride, solution

(1)—Identification Number	(2)—Source 172.***	(3)—Description
UN 2439	102	Sodium hydrogen fluoride
UN 2440	102	Stannic chloride pentahydrate
UN 2441	102	Titanium trichloride, pyrophoric *or* Titanium trichloride mixtures, pyrophoric
UN 2442	102	Trichloroacetyl chloride
UN 2443	102	Vanadium oxitrichloride
UN 2443	101	Vanadium oxytrichloride
NA 2443	101	Vanadium oxytrichloride and titanium tetrachloride mixture
UN 2444	101	Vanadium tetrachloride
UN 2445	102	Lithium alkyls
UN 2446	102	Nitrocresols
UN 2447	102	Phosphorus, white, molten
UN 2448	102	Sulphur, molten
NA 2449	101	Ammonium oxalate
NA 2449	101	Cupric oxalate
UN 2449	102	Oxalates
UN 2451	101	Nitrogen trifluoride
UN 2452	102	Ethyl acetylene, inhibited
UN 2453	102	Ethyl fluoride
UN 2454	102	Methyl fluoride
UN 2456	101	2-Chloropropene
UN 2457	101	2,3-Dimethylbutane
UN 2458	101	Hexadiene
UN 2459	102	2-Methyl-1-butene
UN 2460	102	2-Methyl-2-butene
UN 2460	101	Methyl butene
UN 2461	101	Methylpentadiene
UN 2462	101	Methyl pentane
UN 2462	102	Methylpentanes
UN 2463	102	Aluminium hydride
UN 2463	101	Aluminum hydride
UN 2464	101	Beryllium nitrate
UN 2465	102	Dichloroisocyanuric acid, dry *or* Dichloroisocyanuric acid salts
NA 2465	101	Potassium dichloro-s-triazinetrione
UN 2465	101	Sodium dichloro-s-triazinetrione
UN 2466	101	Potassium superoxide
UN 2467	102	Sodium percarbonates
NA 2468	101	(mono-(Trichloro) tetra-(monopotassium dichloro)-penta-s-triazinetrione, dry
UN 2468	102	Trichloroisocyanuric acid, dry
UN 2468	101	Trichloro-s-triazinetrione
UN 2469	102	Zinc bromate
UN 2470	102	Phenylacetonitrile, liquid
UN 2471	102	Osmium tetroxide
UN 2472	102	Pindone
UN 2473	102	Sodium arsanilate
UN 2474	101	Thiophosgene
UN 2475	102	Vanadium trichloride
UN 2477	102	Methyl isothiocyanate
UN 2478	102	Isocyanates, n o s *or* Isocyanate solutions, n o s
UN 2480	101	Methyl isocyanate
UN 2480	102	Methyl isocyanate *or* Methyl isocyanate solutions
UN 2481	102	Ethyl isocyanate
UN 2482	102	n-Propyl isocyanate
UN 2483	102	Isopropyl isocyanate
UN 2484	102	tert-Butyl isocyanate
UN 2485	101	n-Butyl isocyanate
UN 2486	102	Isobutyl isocyanate
UN 2487	102	Phenyl isocyanate
UN 2488	102	Cyclohexyl isocyanate
UN 2489	102	Diphenylmethane-4,4'diisocyanate
UN 2490	101	Dichloroisopropyl ether
UN 2491	102	Ethanolamine *or* Ethanolamine solutions
UN 2491	101	Monoethanolamine
UN 2493	101	Hexamethyleneimine
UN 2495	101	Iodine pentafluoride
UN 2496	101	Propionic anhydride
UN 2497	101	Sodium phenolate, solid
UN 2498	101	1,2,3,6-Tetrahydrobenzaldehyde
UN 2501	101	Tris-(1-aziridinyl) phosphine oxide
UN 2501	102	Tris-(1-aziridinyl)phosphine oxide, solution
UN 2502	101	Valeryl chloride
UN 2502	102	Valeryl chlorides
UN 2503	102	Zirconium tetrachloride
UN 2503	101	Zirconium tetrachloride, solid
UN 2504	101	Acetylene tetrabromide
UN 2504	102	Tetrabromoethane
UN 2505	101	Ammonium fluoride
UN 2506	101	Ammonium hydrogen sulfate
UN 2506	102	Ammonium hydrogen sulphate
UN 2507	101	Chloroplatinic acid, solid
UN 2508	101	Molybdenum pentachloride
UN 2509	101	Potassium hydrogen sulfate, solid
UN 2509	102	Potassium hydrogen sulphate
UN 2511	102	Chloropropionic acid
UN 2512	102	Aminophenols
UN 2513	102	Bromoacetyl bromide
UN 2514	101	Bromobenzene
UN 2515	102	Bromoform
UN 2516	102	Carbon tetrabromide
UN 2517	101	Chlorodifluoroethane
UN 2517	102	Chlorodifluoroethanes
UN 2518	102	1,5,9-Cyclododecatriene
UN 2520	102	Cyclooctadienes
UN 2521	102	Diketene, inhibited
UN 2522	102	Dimethylaminoethyl methacrylate
UN 2524	102	Ethyl orthoformate
UN 2525	102	Ethyl oxalate
UN 2526	102	Furfurylamine
UN 2527	102	Isobutyl acrylate
UN 2528	102	Isobutyl isobutyrate
UN 2529	101	Isobutyric acid
UN 2530	101	Isobutyric anhydride
UN 2531	102	Methacrylic acid, inhibited
UN 2533	102	Methyl trichloroacetate
UN 2534	102	Methyl chlorosilane
UN 2535	102	Methylmorpholine
UN 2536	102	Methyltetrahydrofuran
UN 2538	102	Nitronapthalene
UN 2541	102	Terpinolene
UN 2542	102	Tributylamine
UN 2545	102	Hafnium
UN 2545	101	Hafnium metal, dry
UN 2546	102	Titanium
UN 2546	101	Titanium metal powder, dry *or* wet
UN 2547	101	Sodium superoxide
UN 2548	102	Chlorine pentafluoride
UN 2550	102	Ethyl methyl ketone peroxide(s)
UN 2550	101	Methyl ethyl ketone peroxide
UN 2551	102	tert-Butyl peroxydiethylacetate
UN 2551	101	tert-Butyl peroxydiethylacetate, with tert-Butyl peroxybenzoate
UN 2552	102	Hexafluoroacetone hydrate
UN 2553	102	Coal tar naphtha
NA 2553	101	Coal tar naptha
UN 2553	101	Naphtha
UN 2554	102	Methyl allyl chloride
UN 2555	102	Nitrocellulose
NA 2555	101	Nitrocellulose, colloided, granular *or* flake, wet with not less than 20% water
NA 2555	101	Nitrocellulose, wet with not less than 20% water
(UN 2556)	102	Nitrocellulose

(1)—Identification Number	(2)—Source 172 ***	(3)—Description
UN 2556	102	Nitrocellulose
NA 2556	101	Nitrocellulose, wet with not less than 30% alcohol *or* solvent
NA 2557	101	Lacquer base, *or* Lacquer chips, dry
UN 2557	102	Nitrocellulose
UN 2558	102	Epibromohydrin
UN 2560	102	2-Methylpentan-2-ol
UN 2561	102	3-Methyl-1-butene
UN 2562	101	tert-Butyl peroxyisobutyrate
UN 2564	102	Trichloroacetic acid
UN 2564	101	Trichloroacetic acid solution
UN 2565	102	Dicyclohexylamine
UN 2567	101	Sodium pentachlorophenate
NA 2570	101	Cadmium acetate
NA 2570	101	Cadmium bromide
NA 2570	101	Cadmium chloride
UN 2570	102	Cadmium compounds
UN 2571	102	Ethylsulphuric acid
UN 2572	102	Phenylhydrazine
UN 2573	102	Thallium chlorate
UN 2574	102	Tricresylphosphate
UN 2576	102	Phosphorus oxybromide, molten
UN 2577	102	Phenylacetyl chloride
UN 2578	102	Phosphorus trioxide
UN 2579	102	Piperazine
UN 2580	102	Aluminium bromide solution
UN 2581	102	Aluminium chloride solution
UN 2582	101	Ferric chloride solution
UN 2582	102	Ferric chloride, solution
UN 2583	102	Alkyl, Aryl *or* Toluene sulphonic acid, solid
UN 2584	101	Alkanesulfonic acid
UN 2584	102	Alkyl, Aryl *or* Toluene sulphonic acid, liquid
NA 2584	101	Dodecylbenzenesulfonic acid
UN 2584	101	Toluene sulfonic acid, liquid
UN 2585	102	Alkyl, Aryl *or* Toluene sulphonic acid, solid
UN 2586	102	Alkyl, Aryl *or* Toluene sulphonic acid, liquid
UN 2587	102	Benzoquinone
NA 2588	101	Insecticide, dry, n.o.s.
UN 2588	102	Pesticides, solid, toxic, n.o.s.
UN 2589	102	Vinyl chloroacetate
UN 2590	102	Asbestos, white
UN 2591	102	Xenon, refrigerated liquid
UN 2592	101	Distearyl peroxydicarbonate
UN 2592	102	Distearylperoxydicarbonate
UN 2593	101	Di-(2-methylbenzoyl)peroxide
UN 2594	101	tert-Butyl peroxyneodecanoate
UN 2595	101	Dimyristyl peroxydicarbonate
UN 2595	102	Dimyristylperoxydicarbonate
UN 2596	101	3-tert-Butyl peroxy-3-phenylphthalide
UN 2596	102	3-tert-Butylperoxy-3-phenyl phthalide
UN 2597	101	Di-(3,5,5-trimethyl-1,2-dioxolanyl-3)peroxide
UN 2598	102	Ethyl-3,3-di(tert-butylperoxy)butyrate
UN 2598	101	Ethyl-3,3-di-(tert-butylperoxy)butyrate
UN 2599	102	Chlorotrifluoromethane and trifluormethane azeotropic mixture
UN 2600	102	Carbon monoxide and hydrogen mixture
UN 2601	102	Cyclobutane
UN 2602	102	Dichlorodifluoromethane and difluoroethane, azeotropic mixture
UN 2603	102	Cycloheptatriene
UN 2604	102	Boron trifluoride diethyletherate
UN 2605	102	Methoxymethyl isocyanate
UN 2606	102	Methyl orthosilicate
UN 2607	102	Acrolein dimer
UN 2608	102	Nitropropanes
UN 2609	102	Triallyl borate
UN 2610	102	Triallylamine
UN 2611	102	Propylene chlorohydrin
UN 2612	102	Methyl propyl ether
UN 2614	102	Methallyl alcohol
UN 2615	102	Ethyl propyl ether
UN 2616	102	Triisopropyl borate
UN 2617	102	Methyl cyclohexanol
UN 2618	102	Vinyl toluenes
UN 2619	102	Benzyl dimethylamine
UN 2620	102	Amyl butyrates
UN 2621	102	Acetyl methyl carbinol
UN 2622	102	Glycidaldehyde
UN 2623	102	Firelighters
UN 2624	102	Magnesium silicide
NA 2626	101	Chloric acid
UN 2626	102	Chloric acid solution
UN 2627	102	Nitrites, inorganic, n.o.s.
UN 2628	102	Potassium fluoroacetate
UN 2629	102	Sodium fluoroacetate
UN 2630	102	Selenates, n.o.s. *or* Selenites, n.o.s.
UN 2630	101	Sodium selenite
UN 2642	102	Fluoroacetic acid
UN 2643	102	Methyl bromoacetate
UN 2644	102	Methyl iodide
UN 2645	102	Phenacyl bromide
UN 2646	101	Hexachlorocyclopentadiene
UN 2647	102	Malononitrile
UN 2648	102	1,2-Dibromobutan-3-one
UN 2649	102	1,3-Dichloroacetone
UN 2650	102	1,1-Dichloro-1-nitroethane
UN 2651	102	4,4'-Diaminodiphenyl methane
UN 2653	102	Benzyl iodide
UN 2655	102	Potassium silicofluoride
UN 2656	101	Quinoline
UN 2657	102	Selenium disulphide
UN 2658	102	Selenium
UN 2659	102	Sodium chloroacetate
UN 2660	102	Mononitrotoluidines
UN 2661	102	Hexachloroacetone
UN 2662	102	Hydroquinone
UN 2664	102	Dibromomethane
UN 2666	102	Ethyl cyanoacetate
UN 2667	102	Butyl toluenes
UN 2668	102	Chloroacetonitrile
UN 2669	102	Chlorocresols
UN 2670	102	Cyanuric chloride
UN 2671	102	Aminopyridines
UN 2672	102	Ammonia solutions
NA 2672	101	Ammonium hydroxide
UN 2673	102	2-Amino-4-chlorophenol
UN 2674	102	Sodium silicofluoride
UN 2676	102	Stibine
UN 2677	102	Rubidium hydroxide, solution
UN 2678	102	Rubidium hydroxide, solid
UN 2679	102	Lithium hydroxide, solution
UN 2680	102	Lithium hydroxide monohydrate
UN 2681	102	Caesium hydroxide, solution
UN 2682	102	Caesium hydroxide, solid
NA 2683	101	Ammonium hydrosulfide solution
UN 2683	101	Ammonium sulfide solution
UN 2683	102	Ammonium sulphide, solution
UN 2684	102	3-(Diethylamino) propylamine
UN 2685	102	N,N-Diethylene diamine
UN 2686	102	Diethylaminoethanol
UN 2687	102	Dicyclohexylammonium nitrate
UN 2688	102	1-Chloro-3-bromopropane

(1)—Identification Number	(2)—Source 172 ***	(3)—Description
UN 2689	102	Glycerol alpha-monochlorohydrin
UN 2690	102	N-n-Butyl imidazole
UN 2691	102	Phosphorus pentabromide
UN 2692	101	Boron tribromide
NA 2693	101	Ammonium bisulfite, solid
NA 2693	101	Ammonium bisulfite solution
UN 2693	102	Bisulphites, inorganic aqueous solution, n.o.s.
NA 2693	101	Calcium hydrogen sulfite solution
NA 2693	101	Potassium metabisulfite
NA 2693	101	Sodium hydrogen sulfite, solid
NA 2693	101	Sodium hydrogen sulfite, solution
NA 2693	101	Sodium metabisulfite
UN 2698	102	Tetrahydrophthalic anhydrides
UN 2699	102	Trifluoroacetic acid
UN 2703	101	Isopropyl mercaptan
UN 2704	101	Propyl mercaptan
UN 2705	102	1-Pentol
UN 2706	102	Diethylcarbinol
UN 2707	102	Dimethyldioxanes
UN 2708	102	Butoxyl
UN 2709	102	Butyl benzenes
UN 2710	102	Dipropylketone
UN 2711	102	Dibromobenzene
UN 2713	102	Acridine
UN 2714	102	Zinc resinate
UN 2715	102	Aluminium resinate
UN 2716	102	1,4-Butynediol
UN 2717	102	Camphor
UN 2718	102	Tripropylaluminum
UN 2719	102	Barium bromate
UN 2720	102	Chromium nitrate
UN 2721	102	Copper chlorate
UN 2722	102	Lithium nitrate
UN 2723	102	Magnesium chlorate
UN 2724	102	Manganese nitrate
UN 2725	101	Nickel nitrate
UN 2726	102	Nickel nitrite
UN 2727	102	Thallium nitrate
UN 2728	101	Zirconium nitrate
UN 2729	102	Hexachlorobenzene
UN 2730	102	Nitroanisoles
UN 2732	102	Nitrobromobenzenes
UN 2733	102	Alkylamines and polyamines
UN 2734	102	Alkylamines and polyamines
UN 2735	102	Alkylamines and polyamines
UN 2738	102	N-n-Butylaniline
UN 2739	102	Butyric anhydride
UN 2740	102	n-Propyl chloroformate
UN 2741	102	Barium hypochlorite
UN 2742	102	Chloroformates, n.o.s.
UN 2743	102	n-Butylchloroformate
UN 2744	102	Cyclobutylchloroformate
UN 2745	102	Chloromethylchloroformate
UN 2746	102	Phenylchloroformate
UN 2747	102	tert-Butylcyclohexylchloroformate
UN 2748	102	2-Ethylhexylchloroformate
UN 2749	102	Tetramethylsilane
UN 2750	102	1,3-Dichloropropanol-2
UN 2751	102	Diethylthiophosphoryl chloride
UN 2752	102	1,2-Epoxy-3-ethyloxy propane
UN 2753	102	N-ethylbenzyltoluidines
UN 2754	102	N-Ethyltoluidines
UN 2755	101	3-Chloroperoxybenzoic acid
UN 2756	101	Organic peroxide, mixture
UN 2756	102	Organic peroxides, mixture
UN 2757	101	Carbamate pesticide, liquid, n.o.s.
UN 2757	101	Carbamate pesticide, solid, n.o.s.
UN 2757	102	Carbamate pesticides, solid, toxic, n.o.s.
NA 2757	101	Carbaryl
NA 2757	101	Carbofuran
NA 2757	101	Carbofuran mixture, liquid
NA 2757	101	Mercaptodimethur
NA 2757	101	Mexacarbate
UN 2758	101	Carbamate pesticide, liquid, n.o.s.
UN 2758	102	Carbamate pesticides, liquid, flammable, toxic, n.o.s.
UN 2759	101	Arsenical pesticide, liquid, n.o.s.
UN 2759	101	Arsenical pesticide, solid, n.o.s.
UN 2759	102	Arsenical pesticides, solid, toxic, n.o.s.
NA 2759	101	Bordeaux arsenite, liquid
NA 2759	101	Bordeaux arsenite, solid
UN 2760	101	Arsenical pesticide, liquid, n.o.s.
UN 2760	102	Arsenical pesticides, liquid, flammable, toxic, n.o.s.
NA 2761	101	Aldrin
NA 2761	101	Aldrin, cast solid
NA 2761	101	Aldrin mixture, dry
NA 2761	101	Aldrin mixture, dry, with 65% or less aldrin
NA 2761	101	DDT *or* Dichlorodiphenyltrichloroethane
NA 2761	101	Dichlone
NA 2761	101	Dieldrin
NA 2761	101	Endosulfan
NA 2761	101	Endosulfan mixture, liquid
NA 2761	101	Endrin
NA 2761	101	Endrin mixture, liquid
NA 2761	101	Heptachlor
NA 2761	101	Kelthane
NA 2761	101	Kepone
NA 2761	101	Lindane
NA 2761	101	Methoxychlor
UN 2761	101	Organochlorine pesticide, liquid, n.o.s.
UN 2761	101	Organochlorine pesticide, solid, n.o.s.
UN 2761	102	Organochlorine pesticides, solid, toxic, n.o.s.
NA 2761	101	TDE
NA 2761	101	Toxaphene
NA 2762	101	Aldrin mixture, liquid
NA 2762	101	Aldrin mixture, liquid, with 60% or less aldrin
NA 2762	101	Chlordane, liquid
UN 2762	101	Organochlorine pesticide, liquid, n.o.s.
UN 2762	102	Organochlorine pesticides, liquid, flammable, toxic, n.o.s.
UN 2763	101	Triazine pesticide, liquid, n.o.s.
UN 2763	101	Triazine pesticide, solid, n.o.s.
UN 2763	102	Triazine pesticides, solid, toxic, n.o.s.
UN 2764	101	Triazine pesticide, liquid, n.o.s.
UN 2764	102	Triazine pesticides, liquid, flammable, toxic, n.o.s.
NA 2765	101	2,4,5-Trichlorophenoxyacetic acid
NA 2765	101	2,4,5-Trichlorophenoxyacetic acid amine, ester, *or* salt
NA 2765	101	2,4,5-Trichlorophenoxypropionic acid
NA 2765	101	2,4,5-Trichlorophenoxypropionic acid ester
NA 2765	101	2,4-Dichlorophenoxyacetic acid
NA 2765	101	2,4-Dichlorophenoxyacetic acid ester
UN 2765	102	Phenoxy pesticides, solid, toxic, n.o.s.
UN 2765	101	Phenoxy pesticide, liquid, n.o.s.
UN 2765	101	Phenoxy pesticide, solid, n.o.s.

(1)—Identification Number	(2)—Source 172.***	(3)—Description
NA 2765	101	Propargite
UN 2766	101	Phenoxy pesticide, liquid, n.o.s.
UN 2766	102	Phenoxy pesticides, liquid, flammable, toxic, n.o.s.
NA 2767	101	Diuron
UN 2767	101	Phenylurea pesticide, liquid, n.o.s.
UN 2767	101	Phenylurea pesticide, solid, n.o.s.
UN 2767	102	Phenyl urea pesticides, solid, toxic, n.o.s.
UN 2768	101	Phenylurea pesticide, liquid, n.o.s.
UN 2768	102	Phenyl urea pesticides, liquid, flammable, toxic, n.o.s.
UN 2769	101	Benzoic derivative pesticide, liquid, n.o.s.
UN 2769	101	Benzoic derivative pesticide, solid, n.o.s.
UN 2769	102	Benzoic derivative pesticides, solid, toxic, n.o.s.
NA 2769	101	Dicamba
NA 2769	101	Dichlobenil
UN 2770	101	Benzoic derivative pesticide, liquid, n.o.s.
UN 2770	102	Benzoic derivative pesticides, liquid, flammable, toxic, n.o.s.
UN 2771	101	Dithiocarbamate pesticide, liquid, n.o.s.
UN 2771	101	Dithiocarbamate pesticide, solid, n.o.s.
UN 2771	102	Dithiocarbamate pesticides, solid, toxic, n.o.s.
NA 2771	101	Thiram
UN 2772	101	Dithiocarbamate pesticide, liquid, n.o.s.
UN 2772	102	Dithiocarbamate pesticides, liquid, flammable, toxic, n.o.s.
UN 2773	101	Phthalimide derivative pesticide, liquid, n.o.s.
UN 2773	101	Phthalimide derivative pesticide, solid, n.o.s.
UN 2773	102	Phthalimide derivative pesticides, solid, toxic, n.o.s.
UN 2774	101	Phthalimide derivative pesticide, liquid, n.o.s.
UN 2774	102	Phthalimide derivative pesticides, liquid, flammable, toxic, n.o.s.
UN 2775	101	Copper based pesticide, liquid, n.o.s.
UN 2775	101	Copper based pesticide, solid, n.o.s.
UN 2775	102	Copper based pesticides, solid, toxic, n.o.s.
UN 2776	101	Copper based pesticide, liquid, n.o.s.
UN 2776	102	Copper based pesticides, liquid, flammable, toxic, n.o.s.
UN 2777	101	Mercury based pesticide, liquid, n.o.s.
UN 2777	101	Mercury based pesticide, solid, n.o.s.
UN 2777	102	Mercury based pesticides, solid, toxic, n.o.s.
UN 2778	101	Mercury based pesticide, liquid, n.o.s.
UN 2778	102	Mercury based pesticides, liquid, flammable, toxic, n.o.s.
UN 2779	101	Substituted nitrophenol pesticide, liquid, n.o.s.
UN 2779	101	Substituted nitrophenol pesticide, solid, n.o.s.
UN 2779	102	Substituted nitrophenol pesticides, solid, toxic, n.o.s.
UN 2780	101	Substituted nitrophenol pesticide, liquid, n.o.s.
UN 2780	102	Substituted nitrophenol pesticides, liquid, flammable, toxic, n.o.s.
UN 2781	101	Bipyridilium pesticide, liquid, n.o.s.
UN 2781	101	Bipyridilium pesticide, solid, n.o.s.
UN 2781	102	Bipyridilium pesticides, solid, toxic, n.o.s.
NA 2781	101	Diquat
UN 2782	101	Bipyridilium pesticide, liquid, n.o.s.
UN 2782	102	Bipyridilium pesticides, liquid, flammable, toxic, n.o.s.
NA 2783	101	Azinphos methyl
NA 2783	101	Azinphos methyl mixture, liquid
NA 2783	101	Chlorpyrifos
NA 2783	101	Coumaphos
NA 2783	101	Coumaphos mixture, liquid
NA 2783	101	Diazinon
NA 2783	101	Dichlorvos
NA 2783	101	Dichlorvos mixture, dry
NA 2783	101	Disulfoton
NA 2783	101	Disulfoton mixture, dry
NA 2783	101	Disulfoton mixture, liquid
NA 2783	101	Ethion
NA 2783	101	Ethion mixture, dry
NA 2783	101	Hexaethyl tetraphosphate mixture, dry
NA 2783	101	Hexaethyl tetraphosphate mixture, liquid
UN 2783	101	Hexaethyl tetraphosphate mixture, liquid
NA 2783	101	Malathion
NA 2783	101	Methyl parathion, liquid
NA 2783	101	Methyl parathion mixture, dry
NA 2783	101	Methyl parathion mixture, liquid
NA 2783	101	Methyl parathion mixture, liquid, (containing 25% or less methyl parathion)
NA 2783	101	Mevinphos
NA 2783	101	Mevinphos mixture, dry
NA 2783	101	Mevinphos mixture, liquid
UN 2783	101	Mipafox
NA 2783	101	Naled
NA 2783	101	Organic phosphate mixture, Organic phosphate compound mixture, *or* Organic phosphorus compound mixture; liquid
NA 2783	101	Organic phosphate mixture, Organic phosphate compound mixture, *or* Organic phosphorus compound mixture; solid *or* dry
NA 2783	101	Organic phosphate, Organic phosphate compound, *or* Organic phosphorus compound; liquid
NA 2783	101	Organic phosphate, Organic phosphate compound, *or* Organic phosphorus compound; solid *or* dry
UN 2783	101	Organophosphorus pesticide, liquid, n.o.s.
UN 2783	101	Organophosphorus pesticide, solid, n.o.s.
UN 2783	102	Organophosphorus pesticides solid, toxic, n.o.s.
NA 2783	101	Parathion, liquid
NA 2783	101	Parathion mixture, dry
NA 2783	101	Parathion mixture, liquid
NA 2783	101	Phencapton
NA 2783	101	Tetraethyl pyrophosphate, liquid
NA 2783	101	Tetraethyl pyrophosphate mixture, dry

(1)—Identification Number	(2)—Source 172 ***	(3)—Description
NA 2783	101	Tetraethyl pyrophosphate mixture, liquid
NA 2783	101	Trichlorfon
UN 2784	101	Organophosphorus pesticide, liquid, n.o.s.
UN 2784	102	Organophosphorus pesticides, liquid, flammable, toxic, n.o.s.
UN 2785	102	4-Thiapentanal
UN 2786	101	Organotin pesticide, liquid, n.o.s.
UN 2786	101	Organotin pesticide, solid, n.o.s.
UN 2786	102	Organotin pesticides, solid, toxic, n.o.s.
UN 2787	101	Organotin pesticide, liquid, n.o.s.
UN 2787	102	Organotin pesticides, liquid, flammable, toxic, n.o.s.
UN 2788	102	Organotin compounds, n.o.s.
UN 2789	101	Acetic acid, glacial
UN 2789	102	Acetic acid, glacial *or* Acetic acid solution
UN 2790	101	Acetic acid
UN 2790	102	Acetic acid solution
NA 2791	101	Aircraft rocket engine
UN 2791	102	Aircraft thrust device
UN 2792	101	Aircraft rocket engine igniter
UN 2792	102	Igniter for aircraft thrust device
UN 2793	102	Ferrous metal borings, shavings, turnings, *or* cuttings
UN 2793	101	Metal borings, shavings, turnings, *or* cuttings
UN 2794	102	Batteries, wet, filled with acid
NA 2794	101	Battery
UN 2794	101	Battery
UN 2795	102	Batteries, wet, filled with alkali
NA 2795	101	Battery
UN 2795	101	Battery
UN 2796	101	Battery fluid, acid
NA 2796	101	Battery fluid, acid, with battery
NA 2796	101	Battery fluid, acid, with electronic equipment *or* actuating device
UN 2796	102	Sulphuric acid
UN 2797	101	Battery fluid, alkali
UN 2797	101	Battery fluid, alkali, with battery
NA 2797	101	Battery fluid, alkali, with electronic equipment *or* actuating device
UN 2798	101	Benzene phosphorus dichloride
UN 2798	102	Phenyl phosphorus dichloride
UN 2799	101	Benzene phosphorus thiodichloride
UN 2799	102	Phenyl phosphorus thiodichloride
UN 2800	102	Batteries, wet, non-spillable
NA 2801	101	Coal tar dye, liquid
UN 2801	101	Dye intermediate, liquid
UN 2801	102	Dyes, n.o.s. *or* Dye intermediates, n.o.s.
UN 2802	101	Copper chloride
UN 2803	102	Gallium
UN 2803	101	Gallium metal, liquid
UN 2803	101	Gallium metal, solid
UN 2805	102	Lithium hydride, fused solid
UN 2805	101	Lithium hydride in fused solid form
UN 2806	101	Lithium nitride
UN 2807	101	Magnetized material
UN 2809	102	Mercury
NA 2809	101	Mercury, metallic
NA 2810	101	Arsenious and mercuric iodide solution
NA 2810	101	Compound, tree *or* weed killing, liquid
NA 2810	101	Drugs, liquid, n.o.s.
UN 2810	101	Poisonous liquid, n.o.s. *or* Poison B, liquid, n.o.s.
UN 2810	102	Poisonous liquids, n.o.s.
NA 2811	101	Drugs, solid, n.o.s.
NA 2811	101	Flue dust, poisonous
NA 2811	101	Lead fluoride
NA 2811	101	Lead iodide
NA 2811	101	Lead stearate
UN 2811	101	Poisonous solid, n.o.s. *or* Poison B solid, n.o.s.
UN 2811	102	Poisonous solids, n.o.s.
NA 2811	101	Selenium oxide
UN 2812	101	Sodium aluminate, solid
NA 2813	101	Lithium acetylide-ethylene diamine complex
UN 2813	102	Substances which, in contact with water, emit flammable gases, n.o.s.
UN 2813	101	Water reactive solid, n.o.s.
NA 2814	101	Etiologic agent, n.o.s.
UN 2814	101	Infectious substance, human, n.o.s.
UN 2815	101	N-Aminoethylpiperazine
UN 2817	101	Ammonium hydrogen fluoride solution
UN 2817	102	Ammonium hydrogen fluoride, solution
UN 2818	101	Ammonium polysulfide solution
UN 2818	102	Ammonium polysulphide, solution
UN 2819	101	Amyl acid phosphate
UN 2820	101	Butyric acid
UN 2820	102	n-Butyric acid
NA 2821	101	Phenol, liquid *or* solution
UN 2821	102	Phenol solutions
UN 2822	102	2-Chloropyridine
UN 2823	101	Crotonic acid
UN 2825	102	N,N-Diisopropyl ethanolamine
UN 2826	101	Ethyl chlorothioformate
UN 2830	101	Lithium ferrosilicon
UN 2831	101	1,1,1-Trichloroethane
UN 2831	102	1,1,1,-Trichloroethane
UN 2834	102	Phosphorous acid, ortho
UN 2835	102	Sodium aluminium hydride
UN 2835	101	Sodium aluminum hydride
UN 2837	101	Sodium hydrogen sulfate solution
UN 2837	102	Sodium hydrogen sulphate, solution
UN 2838	102	Vinyl butyrate, inhibited
UN 2839	102	Aldol
UN 2840	102	Butyraldoxime
UN 2841	102	Di-n-amylamine
UN 2842	102	Nitroethane
UN 2844	102	Calcium manganese silicon
UN 2845	101	Pyrophoric liquid, n.o.s. *or* Pyroforic liquid, n.o.s.
UN 2845	102	Pyrophoric liquids, n.o.s.
UN 2846	102	Pyrophoric solids, n.o.s.
UN 2849	102	3-Chloropropanol-1
UN 2850	102	Propylene tetramer
UN 2851	102	Boron trifluoride dihydrate
UN 2852	102	Dipicryl sulphide, wetted
UN 2853	102	Magnesium silicofluoride
UN 2854	101	Ammonium silicofluoride
UN 2855	101	Zinc silicofluoride
UN 2856	102	Silicofluorides, n.o.s.
UN 2857	101	Refrigerating machine
UN 2857	102	Refrigerating machines
UN 2858	102	Zirconium
UN 2859	102	Ammonium metavanadate
UN 2860	102	Vanadium trioxide
UN 2861	102	Ammonium polyvanadate
UN 2862	101	Vanadium pentoxide
UN 2863	102	Sodium ammonium vanadate
UN 2864	102	Potassium metavanadate
UN 2865	102	Hydroxylamine sulphate
UN 2867	101	Ink

(1)— Identification Number	(2)— Source 172 ***	(3)—Description
UN 2868	101	Resin solution
UN 2869	102	Titanium trichloride mixtures
UN 2870	102	Aluminum borohydride *or* Aluminum borohydride in devices
UN 2871	102	Antimony powder
UN 2872	102	1,2-Dibromo-3-chloropropane
UN 2873	102	N,N Di-n-butylaminoethanol
UN 2874	102	Furfuryl alcohol
UN 2875	102	Hexachlorophene
UN 2876	101	Resorcinol
UN 2877	102	Thiourea
UN 2878	102	Titanium sponge granules *or* Titanium sponge powders
UN 2879	102	Selenium oxychloride
UN 2880	102	Calcium hypochlorate, hydrated *or* Calcium hypochlorite, hydrated mixtures
UN 2880	101	Calcium hypochlorite, hydrated
UN 2881	102	Nickel catalyst, dry
UN 2883	101	2,2-Di-(tert-butylperoxy)propane
UN 2883	102	2,2-Di-(tert-butylperoxy) propane
UN 2884	101	2,2-Di-(tert-butylperoxy)propane
UN 2884	102	2,2-Di-(tert-butylperoxy) propane
UN 2885	101	1,1-Di-(tert-butylperoxy)cyclohexane
UN 2885	102	1,1-Di-(tert-butylperoxy) cyclohexane
UN 2886	102	tert-Butyl peroxy-2-ethylhexanoate
UN 2886	101	tert-Butyl peroxy-2-ethylhexanoate, with 2,2-Di-(tert-butylperoxy)butane
UN 2887	101	tert-Butyl peroxy-2-ethylhexanoate
UN 2888	101	tert-Butyl peroxy-2-ethylhexanoate
UN 2889	102	Diisotridecyl peroxydicarbonate
UN 2889	101	Diisotridecyl peroxydicarbonate
UN 2890	101	tert-Butyl peroxybenzoate
UN 2891	102	tert-Amyl peroxyneodecanoate
UN 2891	101	tert- Amyl peroxyneodecanoate
UN 2892	101	Dimyristyl peroxydicarbonate
UN 2892	102	Dimyristylperoxydicarbonate
UN 2893	102	Dilauroyl peroxide
UN 2893	101	Lauroyl peroxide
UN 2894	101	Di-(4-tert-butylcyclohexyl)peroxydicarbonate
UN 2894	102	Di-(4-tert-butylcyclohexyl) peroxydicarbonate
UN 2895	101	Dicetyl peroxydicarbonate
UN 2895	102	Dicetyl peroxydicarbonate
UN 2896	101	Cyclohexanone peroxide
UN 2896	102	Cyclohexanone peroxides
UN 2897	101	1,1-Di-(tert-butylperoxy)cyclohexane
UN 2897	102	1,1-Di-(tert-butylperoxy) cyclohexane
UN 2898	101	tert-Amyl peroxy-2-ethylhexanoate
UN 2899	102	Organic peroxides, n.o.s., trial quantities
UN 2899	101	Organic peroxide, trial quantity, n.o.s.
UN 2901	102	Bromine chloride
NA 2902	101	Allethrin
NA 2902	101	insecticide, liquid, n.o.s.
UN 2902	102	Pesticides, liquid, toxic, n.o.s.
UN 2903	102	Pesticides, liquid, toxic, flammable, n.o.s.
UN 2904	102	Chlorophenates, liquid
UN 2905	102	Chlorophenates, solid
UN 2906	102	Triisocyanatoisocyanurate of isophoronediisocyanate, solution
UN 2907	102	Isosorbide dinitrate mixture
UN 2908	101	Radioactive material, empty packages
UN 2909	101	Radioactive material, articles, manufactured from natural *or* depleted uranium *or* natural thorium
UN 2910	101	Radioactive material, limited quantity, n.o.s.
UN 2911	101	Radioactive material, instruments and articles
UN 2912	101	Radioactive material, low specific activity *or* LSA, n.o.s.
UN 2918	101	Radioactive material, fissile, n.o.s.
UN 2920	102	Corrosive liquids, flammable, n.o.s.
UN 2921	102	Corrosive solids, flammable, n.o.s.
UN 2922	101	Corrosive liquid, poisonous, n.o.s.
UN 2922	102	Corrosive liquids, poisonous, n.o.s.
NA 2922	101	Dimethyl chlorothiophosphate
NA 2922	101	Sodium hydrosulfide, solution
UN 2923	102	Corrosive solids, poisonous, n.o.s.
NA 2923	101	Sodium hydrosulfide, solid
NA 2924	101	Dichlorobutene
UN 2924	101	Flammable liquid, corrosive, n.o.s.
UN 2924	102	Flammable liquids, corrosive, n.o.s.
UN 2925	101	Flammable solid, corrosive, n.o.s.
UN 2925	102	Flammable solids, corrosive, n.o.s.
UN 2926	101	Flammable solid, poisonous, n.o.s.
UN 2926	102	Flammable solids, poisonous, n.o.s.
UN 2927	102	Poisonous liquids, corrosive, n.o.s.
UN 2928	101	Poisonous solid, corrosive, n.o.s.
UN 2928	102	Poisonous solids, corrosive, n.o.s.
NA 2929	101	Chloropicrin mixture, flammable
UN 2929	102	Poisonous liquids, flammable, n.o.s.
UN 2930	102	Poisonous solids, flammable, n.o.s.
UN 2931	102	Vanadyl sulphate
UN 2933	102	Methyl-2-chloropropionate
UN 2934	102	Isopropyl-2-chloropropionate
UN 2935	102	Ethyl-2-chloropropionate
UN 2936	102	Thiolactic acid
UN 2937	102	alpha-Methylbenzyl alcohol
UN 2938	102	Methylbenzoate
UN 2940	102	9-Phosphabicyclononanes
UN 2941	102	2-Fluoroaniline
UN 2942	102	2-Trifluoromethyl aniline
UN 2943	102	Tetrahydrofurfurylamine
UN 2944	102	4-Fluoroaniline
UN 2945	102	N-Methylbutylamine
UN 2946	102	2-Amino-5-diethylaminopentane
UN 2947	102	Isopropyl chloroacetate
UN 2948	102	3-Trifluoromethyl aniline
UN 2949	102	Sodium hydrosulphide
UN 2950	101	Magnesium granules coated
UN 2950	102	Magnesium granules, coated
UN 2952	102	Azodiisobutyronitrile
UN 2953	102	2,2'-Azodi-(2,4-dimethylvaleronitrile)
UN 2954	102	Azodi-(1,1'-hexahydrobenzonitrile)
UN 2955	102	2,2'-Azodi-(2,4-dimethyl-4-methoxyvaleronitrile)
UN 2957	102	tert-Amyl peroxypivalate
UN 2958	102	Diperoxyazelaic acid
UN 2959	102	2,5-Dimethyl-2,5-di-(benzoylperoxy) hexane
UN 2960	102	Di-(2-ethylhexyl) peroxydicarbonate
UN 2961	102	2,4,4-Trimethylpentyl-2-peroxy phenoxy acetate
UN 2962	102	Disuccinic acid peroxide
UN 2963	102	Cumyl peroxyneodecanoate
UN 2964	102	Cumyl peroxypivalate
UN 2965	102	Boron trifluoride dimethyl etherate
UN 2966	102	Thioglycol
UN 2967	102	Sulphamic acid
UN 2968	102	Maneb, *or* Maneb preparation(s)
UN 2969	102	Castor beans, Castor meal, Castor pomace *or* Castor flake

(1)—Identification Number	(2)—Source 172 ***	(3)—Description
UN 2974	101	Radioactive material, special form, n.o.s.
UN 2975	101	Thorium metal, pyrophoric
UN 2976	101	Thorium nitrate
UN 2977	101	Uranium hexafluoride, fissile
UN 2978	101	Uranium hexafluoride, low specific activity
UN 2979	101	Uranium metal, pyrophoric
UN 2980	101	Uranyl nitrate hexahydrate solution
UN 2981	101	Uranyl nitrate, solid
UN 2982	101	Radioactive material, n.o.s.
UN 2983	102	Ethylene oxide and propylene oxide mixtures
UN 2984	102	Hydrogen peroxide, aqueous solutions
UN 2989	102	Lead phosphite dibasic
UN 2991	102	Carbamate pesticides, liquid, toxic, flammable, n.o.s.
UN 2992	102	Carbamate pesticides, liquid, toxic, n.o.s.
UN 2993	102	Arsenical pesticides, liquid, toxic, flammable, n.o.s.
UN 2994	102	Arsenical pesticides, liquid, toxic, n.o.s.
UN 2995	102	Organochlorine pesticides, liquid, toxic, flammable, n.o.s.
UN 2996	102	Organochlorine pesticides, liquid, toxic, n.o.s.
UN 2997	102	Triazine pesticides, liquid, toxic, flammable, n.o.s.
UN 2998	102	Triazine pesticides, liquid, toxic, n.o.s.
UN 2999	102	Phenoxy pesticides, liquid, toxic, flammable, n.o.s.
UN 3000	102	Phenoxy pesticides, liquid, toxic, n.o.s.
UN 3001	102	Phenyl urea pesticides, liquid, toxic, flammable, n.o.s.
UN 3002	102	Phenyl urea pesticides, liquid, toxic, n.o.s.
UN 3003	102	Benzoic derivative pesticides, liquid, toxic, flammable, n.o.s.
UN 3004	102	Benzoic derivative pesticides liquid, toxic, n.o.s.
UN 3005	102	Dithiocarbamate pesticides, liquid, toxic, flammable, n.o.s.
UN 3006	102	Dithiocarbamate pesticides, liquid, toxic, n.o.s.
UN 3007	102	Phthalimide derivative pesticides, liquid, toxic, flammable n.o.s.
UN 3008	102	Phthalimide derivative pesticides, liquid, toxic, n.o.s.
UN 3009	102	Copper based pesticides, liquid, toxic, flammable, n.o.s.
UN 3010	102	Copper based pesticides, liquid, toxic, n.o.s.
UN 3011	102	Mercury based pesticides, liquid, toxic flammable, n.o.s.
UN 3012	102	Mercury based pesticides, liquid, toxic, n.o.s.
UN 3013	102	Substituted nitrophenol pesticides, liquid, toxic, flammable, n.o.s.
UN 3014	102	Substituted nitrophenol pesticides, liquid, toxic, n.o.s.
UN 3015	102	Bipyridilium pesticides, liquid, toxic, flammable, n.o.s.
UN 3016	102	Bipyridilium pesticides, liquid, toxic, n.o.s.
UN 3017	102	Organophosphorus pesticides, liquid, toxic, flammable, n.o.s.
UN 3018	102	Organophosphorus pesticides, liquid, toxic, n.o.s.
UN 3019	102	Organotin pesticides, liquid, toxic, flammable, n.o.s.
UN 3020	102	Organotin pesticides, liquid, toxic, n.o.s.
UN 3021	102	Pesticides, liquid, flammable, toxic, n.o.s.
NA 9011	101	Camphene
NA 9018	101	Dichlorodifluoroethylene
NA 9026	101	Dinitrocyclohexylphenol
NA 9035	101	Gas identification set
NA 9037	101	Hexachloroethane
NA 9053	101	Oiled material
NA 9069	101	Tetramethylmethylenediamine
NA 9077	101	Adipic acid
NA 9078	101	Aluminum sulfate, solid
NA 9079	101	Ammonium acetate
NA 9080	101	Ammonium benzoate
NA 9081	101	Ammonium bicarbonate
NA 9083	101	Ammonium carbamate
NA 9084	101	Ammonium carbonate
NA 9085	101	Ammonium chloride
NA 9086	101	Ammonium chromate
NA 9087	101	Ammonium citrate, dibasic
NA 9088	101	Ammonium fluoborate
NA 9089	101	Ammonium sulfamate
NA 9090	101	Ammonium sulfite
NA 9091	101	Ammonium tartrate
NA 9092	101	Ammonium thiocyanate
NA 9093	101	Ammonium thiosulfate
NA 9094	101	Benzoic acid
NA 9095	101	n-Butyl phthalate
NA 9096	101	Calcium chromate
NA 9097	101	Calcium dodecylbenzenesulfonate
NA 9099	101	Captan
NA 9100	101	Chromic sulfate
NA 9101	101	Chromic acetate
NA 9102	101	Chromous chloride
NA 9103	101	Cobaltous bromide
NA 9104	101	Cobaltous formate
NA 9105	101	Cobaltous sulfamate
NA 9106	101	Cupric acetate
NA 9109	101	Cupric sulfate
NA 9110	101	Cupric sulfate, ammoniated
NA 9111	101	Cupric tartrate
NA 9117	101	Ethylenediaminetetraacetic acid
NA 9118	101	Ferric ammonium citrate
NA 9119	101	Ferric ammonium oxalate
NA 9120	101	Ferric fluoride
NA 9121	101	Ferric sulfate
NA 9122	101	Ferrous ammonium sulfate
NA 9125	101	Ferrous sulfate
NA 9126	101	Fumaric acid
NA 9127	101	Isopropanolamine dodecylbenzenesulfonate
NA 9134	101	Lithium chromate
NA 9137	101	Naphthenic acid
NA 9138	101	Nickel ammonium sulfate
NA 9139	101	Nickel chloride
NA 9140	101	Nickel hydroxide
NA 9141	101	Nickel sulfate
NA 9142	101	Potassium chromate
NA 9145	101	Sodium chromate
NA 9146	101	Sodium dodecylbenzenesulfonate
NA 9147	101	Sodium phosphate, dibasic
NA 9148	101	Sodium phosphate, tribasic
NA 9149	101	Strontium chromate
NA 9151	101	Triethanolamine dodycylbenzenesulfonate
NA 9152	101	Vanadyl sulfate

(1)—Identification Number	(2)—Source 172 ***	(3)—Description
NA 9153	101	Zinc acetate
NA 9154	101	Zinc ammonium chloride
NA 9155	101	Zinc borate
NA 9156	101	Zinc bromide
NA 9157	101	Zinc carbonate
NA 9158	101	Zinc fluoride
NA 9159	101	Zinc formate
NA 9160	101	Zinc phenolsulfonate
NA 9161	101	Zinc sulfate
NA 9162	101	Zirconium potassium fluoride
NA 9163	101	Zirconium sulfate
NA 9180	101	Uranyl acetate
NA 9183	101	Organic peroxide, liquid *or* solution, n.o.s.
NA 9184	101	Pyrethrins
NA 9187	101	Organic peroxide, solid, n.o.s.
NA 9188	101	Hazardous substance, liquid *or* solid, n.o.s.
NA 9189	101	Hazardous waste, liquid *or* solid, n.o.s.
NA 9190	101	Ammonium permanganate
NA 9191	101	Chlorine dioxide hydrate, frozen
NA 9193	101	Oxidizer, corrosive, liquid, n.o.s.
NA 9194	101	Oxidizer, corrosive, solid, n.o.s.
NA 9195	101	Metal alkyl, solution, n.o.s.
NA 9199	101	Oxidizer, poisonous, liquid, n.o.s.
NA 9200	101	Oxidizer, poisonous, solid, n.o.s.
NA 9201	101	Antimony trioxide
NA 9202	101	Carbon monoxide, cryogenic liquid
NA 9206	101	Methyl phosphonic dichloride

(49 U.S.C. 1803, 1804, 1808, 49 CFR 1.53, App. A to Part 1)

[Amdt. 172-85, 48 FR 50446, Nov. 1, 1983, as amended by Amdt. 172-89, 49 FR 7385, Feb. 29, 1984; Amdt. 172-94, 49 FR 38134, Sept. 27, 1984]

Subpart C—Shipping Papers

§ 172.200 Applicability.

(a) *Description of hazardous materials required.* Except as otherwise provided in this subpart, each person who offers a hazardous material for transportation shall describe the hazardous material on the shipping paper in the manner required by this subpart.

(b) This subpart does not apply to any material other than a hazardous waste or a hazardous substance, that is:

(1) An ORM-A, B, or C, unless it is offered or intended for transportation by air when it is subject to the regulations pertaining to transportation by air as specified in § 172.101; or

(2) An ORM-A, B, or C, unless it is offered or intended for transportation by water when it is subject to the regulations pertaining to transportation by water as specified in § 172.101; or

(3) An ORM-D unless it is offered or intended for transportation by air.

[Amdt. 172-29A, 41 FR 40677, Sept. 20, 1976, as amended by Amdt. 172-58, 45 FR 34697, May 22, 1980; Amdt. 172-74, 47 FR 43065, Sept. 30, 1982]

§ 172.201 General entries.

(a) *Contents.* When a description of hazardous material is required to be included on a shipping paper, that description must conform to the following requirements:

(1) When a hazardous material and a material not subject to the requirements of this subchapter are described on the same shipping paper, the hazardous material description entries required by § 172.202 and those additional entries that may be required by § 172.203:

(i) Must be entered first, or

(ii) Must be entered in a color that clearly contrasts with any description on the shipping paper of a material not subject to the requirements of this subchapter, except that a description on a reproduction of a shipping paper may be highlighted, rather than printed, in a contrasting color (the provisions of this paragraph apply only to the basic description required by § 172.202(a) (1) and (2), and (3)), or

(iii) Must be identified by the entry of an "X" placed before the proper shipping name in a column captioned "HM." (The "X" may be replaced by "RQ," if appropriate.)

(2) The required shipping description on a shipping paper and all copies thereof used for transportation purposes, must be legible and printed (manually or mechanically) in English.

(3) Unless it is specifically authorized or required in this subpart, the required shipping description may not contain any code or abbreviation.

(4) A shipping paper may contain additional information concerning the material provided the information is not inconsistent with the required description. Unless otherwise permitted or required by this subpart, additional information must be placed after the basic description required by § 172.202(a).

(i) When appropriate, the entries "IMO" or "IMO Class" may be entered immediately before or immediately following the class entry in the basic description.

(ii) For a material meeting the definition of more than one hazard class, the additional hazard class or classes may be entered after the hazard class in the basic description.

(b) *Name of shipper.* A shipping paper for a shipment by water must contain the name of the shipper.

(c) *Continuation page.* A shipping paper may consist of more than one page, if each page is consecutively numbered and the first page bears a notation specifying the total number of pages included in the shipping paper. For example, "Page 1 of 4 pages."

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 172-29A, 41 FR 40677, Sept. 20, 1976, as amended by Amdt. 172-29B, 41 FR 57067, Dec. 30, 1976; Amdt. 172-58, 45 FR 34697, May 22, 1980; Amdt. 172-58, 45 FR 74664, Nov. 10, 1980; Amdt. 172-75, 47 FR 44471, Oct. 7, 1982; Amdt. 172-90, 49 FR 10510, Mar. 20, 1984]

§ 172.202 Description of hazardous material on shipping papers.

(a) The shipping description of a hazardous material on the shipping paper must include:

(1) The proper shipping name prescribed for the material in § 172.101 or § 172.102 (when authorized);

(2) The hazard class prescribed for the material in the same section. Except for a proper shipping name that contains words describing more than one hazard class, inclusion of the hazard class is not required when the words of the proper shipping name contain the key word or words of the hazard class of the material, such as Flammable liquid; Poison B, liquid; Radioactive device; or Corrosive liquid;

(3) The identification number (preceded by "UN" or "NA" as appropriate) prescribed for the material in the same section; and

(4) Except for empty packagings, the total quantity (by weight, volume, or as otherwise appropriate) of the hazardous material covered by the description.

(b) Except as provided in this subpart, the basic description specified in paragraphs (a) (1), (2) and (3) of this section must be shown in sequence. For example: "Gasoline, Flammable liquid, UN1203".

(c) The total quantity of the material covered by one description must appear before or after, or both before and after, the description required and authorized by this subpart.

(1) Abbreviations may be used to specify the type of packaging and weight or volume. For example:" 40 cyl. Nitrogen, Non-flammable gas,UN1066, 800 pounds; 1 box Cement, Flammable liquid, NA1133, 25 lbs."

(2) The type of packaging and destination marks may be entered in any appropriate manner before or after the basic description.

(d) Technical and chemical group names may be entered in parentheses between the proper shipping name and hazard class.

(e) Except as provided in §§ 171.11 and 171.12 of this subchapter, a material that is not a hazardous material according to this subchapter may not be described by a basic description on a shipping paper indicating it is a hazardous material.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 172-101, 45 FR 74665, Nov. 10, 1980, as amended by Amdt. 172-81, 48 FR 28098, June 20, 1983; Amdt. 172-94, 49 FR 38134, Sept. 27, 1984]

§ 172.203 Additional description requirements.

(a) *Exemptions.* Each shipping paper issued in connection with a shipment made under an exemption must bear the notation "DOT-E" followed by the exemption number assigned and so located that the notation is clearly associated with the description to which the exemption applies.

(b) *Limited quantities.* The description for a material offered for transportation as "limited quantity," as authorized by this subchapter, must include the words "Limited Quantity" or "Ltd Qty" following the basic description.

(c) *Hazardous substances.* (1) If the proper shipping name for a mixture or solution that is a hazardous substance does not identify the constituents making it a hazardous substance, the name or names of such hazardous substance constituents as shown in § 172.101 shall be entered in association with the basic description. This requirement also applies when descriptions from the Optional Table in § 172.102 are used.

(2) The letters "RQ" shall be entered on the shipping paper either before or after the basic description required by § 172.202 for each hazardous substance (see definition in § 171.8). For example: "RQ, Cresol, Corrosive material, UN2076; or Adipic acid, ORM-E, NA9077 RQ".

(d) *Radioactive material.* (1) The description for a shipment of radioactive material must include the following additional entries as appropriate:

(i) The name of each radionuclide in the radioactive material that is listed in § 173.435 of this subchapter. Abbreviations, e.g., "^{99}Mo" are authorized.

(ii) A description of the physical and chemical form of the material, if the material is not in special form (generic chemical description is acceptable for chemical form).

(iii) The activity contained in each package of the shipment in terms of curies, millicuries, or microcuries. Abbreviations are authorized. For the shipment of a package containing a highway route controlled quantity of radioactive materials (see § 173.403(l) of this subchapter), the words "Highway route controlled quantity" must be entered in association with the basic description.

(iv) The category of label applied to each package in the shipment. For example: "RADIOACTIVE WHITE-I."

(v) The transport index assigned to each package in the shipment bearing RADIOACTIVE YELLOW-II or RADIOACTIVE YELLOW-III labels.

(vi) For a shipment of fissile radioactive materials:

(A) The words "Fissile Exempt," if the package is exempt pursuant to § 173.453 of this subchapter, or

(B) If not exempt, the fissile class of each package in the shipment, pursuant to § 173.455 of this subchapter; and

(C) For a Fissile Class III shipment, the additional notation: "Warning—Fissile Class III Shipment. Do not Load More Than * * * Packages per Vehicle." (Asterisks to be replaced by appropriate number.) "In loading and Storage Areas, Keep at Least 20 Feet (6 Meters) from Other Packages Bearing Radioactive Labels."

(D) If a Fissile Class III shipment is to be transported by water, the supplementary notation must also include the following statement: "For shipment by water, only one Fissile Class III shipment is permitted in each hold."

(vii) For a package approved by the U.S. Department of Energy (DOE) or U.S. Nuclear Regulatory Commission (USNRC), a notation of the package identification marking as prescribed in the applicable DOE or USNRC approval. (See § 173.471 of the subchapter.)

(viii) For an export shipment or a shipment in a foreign made package, a notation of the package identification marking as prescribed in the applicable International Atomic Energy Agency (IAEA) Certificate of Competent Authority which has been issued for the package. (See § 173.473 of the subchapter.)

(e) *Empty packagings.* (1) Except for a tank car, or any packaging that still contains a hazardous substance, the description on the shipping paper for an empty packaging containing the residue of a hazardous material may include the word(s) "EMPTY" or "EMPTY: Last contained * * *" as appropriate in association with the basic description of the hazardous material last contained in the packaging.

(2) For empty tank cars, see § 174.25(c), of this subchapter.

(3) If a packaging, including a tank car, contains a residue that is a hazardous substance, the description on the shipping paper shall be prefaced with the phrase "EMPTY:Last contained * * *" and shall have "RQ" entered before or after the basic description.

(f) *Transportation by air.* When a package containing a hazardous material is offered for transportation by air and this subchapter prohibits its transportation aboard passenger-carrying aircraft, the words "Cargo aircraft only" must be entered after the basic description.

(g) *Transportation by rail.* (1) The shipping paper for a rail car containing a hazardous material must contain the notation "Placarded" followed by the name of the placard required for the rail car.

(2) The shipping paper for each Class DOT-113 tank car containing a flammable gas must contain an appropriate notation, such as "DOT-113A," and the statement "Do Not Hump or Cut Off Car While in Motion."

(h) *Transportation by highway.* Following the basic description for a hazardous material in a specification MC 330 or MC 331 cargo tank made of quenched and tempered steel, there must be entered for:

(1) *Anhydrous ammonia.* (i) The words "0.2 per cent water" to indicate the suitability for shipping anhydrous ammonia in the cargo tank as authorized by § 177.817 of this subchapter, or

(ii) The words "NOT FOR Q AND T TANKS" when the anhydrous ammonia does not contain 0.2 per cent or more water by weight.

(2) *Liquefied petroleum gas.* The word "Non-corrosive" or "Non-cor" to indicate the suitability for shipment of the "Non-corrosive" liquefied petroleum gas offered for transportation by cargo tank as authorized by § 173.315(a)(1) Note 15 of this subchapter.

(i) *Transportation by water.* (1) Each shipment by water must have the following additional shipping paper entries:

(i) Identification of the type of packages such as barrels, drums, cylinders, and boxes,

(ii) The number of each type of package including those in a freight container or on a pallet, and

(iii) The gross weight of each type of package or the individual gross weight of each package.

(2) The shipping paper for a hazardous material offered for transportation by vessel to any country outside the United States must have in parentheses the technical name of the material immediately following the proper shipping name when the material is described by an n.o.s. entry in § 172.101 or § 172.102. For example: "Corrosive liquid, n.o.s. (Caprylyl chloride), UN1760." If the material is a mixture of two or more hazardous materials, the names of at least two components most predominately contributing to the hazard or hazards of the mixture shall be entered in parentheses. For example: "Flammable liquid, corrosive, n.o.s. (Methyl alcohol, Potassium hydroxide), UN2924." The provisions of this paragraph do not apply:

(i) If the n.o.s. description for the material (other than a mixture of hazardous materials of different classes meeting the definition of more than one hazard class) contains the name of the chemical element or group which is primarily responsible for the material being included in the hazard class indicated. For example: "Mercury compound, solid, n.o.s., Poison B, UN2025."

(ii) If the n.o.s. description for the material (which is a mixture of hazardous materials of different classes meeting the definition of more than one hazard class) contains the name of the chemical element or group responsible for the material meeting the definition of one of these classes. In such cases, only the technical name of the component that is not appropriately identified in the n.o.s. description shall be entered in parentheses. For example: "Carbamate pesticide, liquid, n.o.s. (contains Xylene), Flammable liquid, UN2758, Poison."

(3) The entry "Skin corrosive only" must be included to also authorize "under deck" stowage for corrosive liquid, n.o.s. and corrrosive solid, n.o.s. that meet only the corrosion to skin criteria of § 173.240(a)(1).

(j) *Dangerous When Wet.* The words "Dangerous When Wet" shall be entered on the shipping paper in association with the basic description when a package covered by the basic description is required to be labeled with a DANGEROUS WHEN WET label.

(k) *Poisonous materials.* Notwithstanding the class to which a material is assigned:

(1) If the name of the compound or principal constituent that causes a ma-

terial to meet the definition of a poison (according to this subchapter) is not included in the proper shipping name for the material, the name of that compound or constituent shall be entered on the shipping paper in association with the shipping description for the material. The name of the compound or principal constituent may be either a technical name or any name for the material that is listed in the NIOSH Registry. This subparagraph does not apply to:

(i) A material having a proper shipping name that includes the chemical element or group which causes the material to be a poison.

(ii) Limited Quantities.

(2) If a liquid or solid material in a package meets the definition of a poison according to this subchapter, and the fact that it is a poison is not disclosed in the shipping name or class entry, the word "Poison" shall be entered on the shipping paper in association with the shipping description.

(3) The provisions of paragraphs (k)(1) and (2) of this section do not apply:

(i) To consumer commodities, ORM-D, or

(ii) To compounds or principal constituents that would cause death by corrosive destruction to tissue rather than by systemic poisoning.

(4) If the inhalation toxicity of any material falls within the criteria specified in § 173.3a(b)(2) (subject to definitions and implementation conditions of (c) and (d) of the same section), the words "Poison-Inhalation Hazard" shall be entered on the shipping paper in association with the shipping description. However, the word "Poison" need not be repeated if it is entered as part of the basic description or in conformance with paragraph (k)(2) of this section. This paragraph does not apply to packagings having primary containment units of one liter capacity or less.

(l) *IM portable tanks*. A hazardous material described by an "n.o.s" entry in § 172.101 or § 172.102 (when authorized) and offered for transportation in an IM portable tank must be described on shipping papers in accordance with the provisions of paragraph (i)(2) of this section.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53; App. A to Part 1)

[Amdt. 172-29A, 41 FR 40677, Sept. 20, 1976]

EDITORIAL NOTE: For Federal Register citations affecting § 172.203, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

EFFECTIVE DATE NOTE: Section 172.203 was amended at 50 FR 39007, Sept. 26, 1985, by revising paragraph (e), effective October 1, 1986. The text of paragraph (e) effective October 1, 1986, is set forth below. Section 172.203 was further amended at 50 FR 41095, Oct. 8, 1985, effective January 1, 1986, by adding paragraph (k)(4). The text of paragraph (k)(4) is set forth above.

§ 172.203 Additional description requirements.

* * * * *

(e) *Empty packagings*. (1) The description on the shipping paper for a packaging containing the residue of a hazardous material may include the words "RESIDUE: Last Contained * * *" in association with the basic description of the hazardous material last contained in the packaging.

(2) For a tank car containing the residue (as defined in 171.8) of a hazardous material, the requirements of § 174.25(c) and paragraph (e)(3) of this section apply.

(3) If a packaging, including a tank car, contains a residue that is a hazardous substance, the description on the shipping papers must be prefaced with the phrase "RESIDUE: Last Contained * * *" and the letters "RQ" must be entered on the shipping paper either before or after the basic description.

* * * * *

§ 172.204 Shipper's certification.

(a) *General.* Except as provided in paragraphs (b) and (c) of this section, each person who offers a hazardous material for transportation shall certify that the material is offered for transportation in accordance with this subchapter by printing (manually or mechanically) on the shipping paper containing the required shipping description the certification contained in paragraph (a)(1) of this section or the certification (declaration) containing the language contained in paragraph (a)(2) of this section.

(1) "This is to certify that the above-named materials are properly classified, described, packaged, marked and

labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation."

Note: In line one of the certification the words "herein-named" may be substituted for the words "above-named".

(2) "I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked and labeled, and are in all respects in proper condition for transport by [*] according to applicable international and national governmental regulations."

*Additional language indicating the modes of transportation to be used may be inserted at this point in the certification. All modes of transportation may be indicated provided that any mode not applicable to a specific shipment is deleted (lined out).

(b) *Exceptions.* (1) Except for a hazardous waste, no certification is required for a hazardous materials offered for transportation by motor vehicle and transported:

(i) In a cargo tank supplied by the carrier, or

(ii) By the shipper as a private carrier except for a hazardous material that is to be reshipped or transferred from one carrier to another.

(2) No certification is required for the return of an empty tank car which previously contained a hazardous material and which has not been cleaned or purged.

(c) *Transportation by air*—(1) *General.* Certification containing the following language may be used in place of the certification required by paragraph (a) of this section:

I hereby certify that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked and labeled, and in proper condition for carriage by air according to applicable national governmental regulations.

(2) *Certificate in duplicate.* Each person who offers a hazardous material to an aircraft operator for transportation by air shall provide two copies of the certification required in this section. (See § 175.30 of this subchapter.)

(3) *Passenger and cargo aircraft.* Each person who offers for transportation by air a hazardous material authorized for air transportation shall add to the certification required in this section the following statement:

This shipment is within the limitations prescribed for passenger aircraft/cargo aircraft only (delete nonapplicable).

(4) *Radioactive material.* Each person who offers any radioactive material for transportation aboard a passenger-carrying aircraft shall sign (mechanically or manually) a printed certificate stating that the shipment contains radioactive material intended for use in, or incident to, research, or medical diagnosis or treatment.

(d) *Signature.* The certifications required by paragraph (a) or (c) of this section:

(1) Must be legibly signed by a principal, officer, partner, or employee of the shipper or his agent; and

(2) May be legibly signed manually, by typewriter, or by other mechanical means.

(49 U.S.C. 1803, 1804, 1806, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 172-29A, 41 FR 40677, Sept. 20, 1976]

Editorial Note: For Federal Register citations affecting § 172.204, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 172.205 Hazardous waste manifest.

(a) No person may offer, transport, transfer, or deliver a hazardous waste (waste) unless an EPA Form 8700-22 and 8700-22A (when necessary) hazardous waste manifest (manifest) is prepared in accordance with 40 CFR 262.20 and is signed, carried, and given as required of that person by this section.

(b) The shipper (generator) shall prepare the manifest in accordance with 40 CFR Part 262.

(c) The original copy of the manifest must be dated by, and bear the handwritten signature of, the person representing:

(1) The shipper (generator) of the waste at the time it is offered for transportation, and

(2) The initial carrier accepting the waste for transportation.

(d) A copy of the manifest must be dated by, and bear the handwritten signature of the person representing:

(1) Each subsequent carrier accepting the waste for transportation, at the time of acceptance, and

(2) The designated facility receiving the waste, upon receipt.

(e) A copy of the manifest bearing all required dates and signatures must be:

(1) Given to a person representing each carrier accepting the waste for transportation,

(2) Carried during transportation in the same manner as required by this subchapter for shipping papers,

(3) Given to a person representing the designated facility receiving the waste,

(4) Returned to the shipper (generator) by the carrier that transported the waste from the United States to a foreign destination with a notation of the date of departure from the United States, and

(5) Retained by the shipper (generator) and by the initial and each subsequent carrier for three years from the date the waste was accepted by the initial carrier. Each retained copy must bear all required signatures and dates up to and including those entered by the next person who received the waste.

(f) The requirements of paragraphs (d) and (e) of this section do not apply to a rail carrier when waste is delivered to a designated facility by railroad if:

(1) All of the information required to be entered on the manifest (except generator and carrier identification numbers and the generator's certification) is entered on the shipping paper carried in accordance with § 174.26(c) of this subchapter;

(2) The delivering rail carrier obtains and retains a receipt for the waste that is dated by and bears the handwritten signature of the person representing the designated facility; and

(3) A copy of the shipping paper is retained for three years by each railroad transporting the waste.

(g) The person delivering a hazardous waste to an initial rail carrier shall send a copy of the manifest, dated and signed by a representative of the rail carrier, to the person representing the designated facility.

(h) A hazardous waste manifest required by 40 CFR Part 262, containing all of the information required by this subpart, may be used as the shipping paper required by this subpart.

(Approved by the Office of Management and Budget under control number 2137-0034)

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 172-58, 45 FR 34698, May 22, 1980, as amended by Amdt. 172-90, 49 FR 10510, Mar. 20, 1984; 49 FR 11184, Mar. 26, 1984]

Subpart D—Marking

§ 172.300 Applicability.

(a) Each person who offers a hazardous material for transportation shall mark each package, freight container, and transport vehicle containing the hazardous material in the manner required by this subpart.

(b) When assigned the function by this subpart, each carrier that transports a hazardous material shall mark each package, freight container, and transport vehicle containing the hazardous material in the manner required by this subpart.

[Amdt. 172-101, 45 FR 74666, Nov. 10, 1980]

§ 172.301 General marking requirements.

(a) Except as provided by this subchapter, each person who offers for transportation a hazardous material in a packaging having a rated capacity of 110 gallons or less shall mark the package with the proper shipping name and identification number (preceded by "UN" or "NA" as appropriate) assigned to the material in § 172.101 or § 172.102 (when authorized). In addition, if the inhalation toxicity of any material in a package falls within the criteria specified in § 173.3a(b)(2), the package shall be marked "Inhalation Hazard" in association with the required label(s). This additional marking requirement does not apply to packaging having primary containment units of one liter capacity or less and to packagings of greater than 110 gallons capacity.

(4) The proper shipping name is not required to include the word "Waste" as specified by § 172.101(c)(10) if the package bears the EPA marking prescribed by 40 CFR 262.32.

(5) When it has been determined by the shipper that a package has been previously marked as required for the material it contains, it need not be remarked. (For empty packagings, see § 173.29 of this subchapter.)

(c) This section does not apply to:

(1) Display of identification numbers on packages containing Limited Quantities (see § 171.8 of this subchapter) or materials classed as ORM-D (see § 173.1200 of this subchapter) when packed with no other hazardous material.

(2) Display of identification numbers on packagings having a rated capacity of 110 gallons or less filled for shipment prior to July 1, 1983.

NOTE: EPA requires special markings for hazardous wastes. See 40 CFR 262.32.

[Amdt. 172-101, 45 FR 74666, Nov. 10, 1980, as amended by Amdt. 172-74, 47 FR 43065, Sept. 30, 1982; Amdt. 172-99, 50 FR 41096, Oct. 8, 1985]

EFFECTIVE DATE NOTE: Section 172.301 was amended at 50 FR 41096, Oct. 8, 1985, effective January 1, 1986, by adding two sentences at the end of paragraph (a).

§ 172.302 Export shipments by water.

(a) Each package of hazardous material offered for export by water and described by a "n.o.s." entry in § 172.101 or § 172.102 (when authorized) must have the technical name or names of the material added in parentheses immediately following the proper shipping name (see § 172.203(i)(2)). For example: Corrosive liquid, n.o.s. (Caprylyl chloride).

(b) For a mixture of two or more hazardous materials, the technical name of at least two components most predominately contributing to the hazard or hazards of the mixture must be added in parentheses immediately following the proper shipping name.

[Amdt. 172-101, 45 FR 74666, Nov. 10, 1980, as amended by Amdt. 172-74, 47 FR 43065, Sept. 30, 1982]

§ 172.304 Marking requirements.

(a) The marking required in this subpart—(1) Must be durable, in English and printed on or affixed to the surface of a package or on a label, tag, or sign.

(2) Must be displayed on a background of sharply contrasting color;

(3) Must be unobscured by labels or attachments; and

(4) Must be located away from any other marking (such as advertising) that could substantially reduce its effectiveness.

[Amdt. 172-29, 41 FR 15996, Apr. 15, 1976, as amended by Amdt. 172-29B, 41 FR 57067, Dec. 30, 1976]

§ 172.306 Consignee's or consignor's name and address.

(a) Each package containing a hazardous material offered for transportation must be marked with the name and address of the consignee or consignor except when the package is:

(1) Transported by highway and will not be transferred from one motor carrier to another, or

(2) Part of a carload lot, truckload lot, or freight container load, and the entire contents of the rail car, truck or freight container are tendered from one consignor to one consignee, or

(3) A portable tank, cargo tank or tank car.

[Amdt. 172-29, 41 FR 15996, Apr. 15, 1976, as amended by Amdt. 172-29A, 41 FR 40678, Sept. 20, 1976; Amdt. 172-29B, 41 FR 57067, Dec. 30, 1976]

§ 172.308 Authorized abbreviations.

(a) Abbreviations may not be used in a proper shipping name marking except in the following instances:

(1) For marking descriptions of ammunition, such as Ammunition for cannon without projectile, etc., the words "with" or "without" may be abbreviated as "W" or "W/O". For example: "Ammunition for cannon W/O projectile."

(2) The abbreviation "ORM" may be used in place of the words "Other Regulated Material."

[Amdt. 172-101, 45 FR 74666, Nov. 10, 1980]

§ 172.310 Radioactive materials.

(a) In addition to any other markings required by this subpart, each package containing radioactive materials must be marked as follows: (1) Each package of radioactive materials in excess of 110 pounds (50 kilograms) must have its gross weight plainly and durably marked on the outside of the package.

(2) Each package of radioactive materials which conforms to the requirements for Type A or Type B packaging (§ 173.403 of this subchapter) must be plainly and durably marked on the outside of the package in letters at least ½-inch (13 mm.) high, with the words "TYPE A" or "TYPE B" as appropriate. A packaging which is not in compliance with these requirements may not be so marked.

(3) Each package of radioactive material destined for export shipment must also be marked "USA" in conjunction with the specification marking, or other package certificate identification. (See §§ 173.471 173.472, and 173.473 of this subchapter.)

(49 U.S.C. 1803, 1804, 1808, 49 CFR 1.53, App. A to Part 1)

[Amdt. 172-29, 41 FR 15996, Apr. 15, 1976, as amended by Amdt. 172-78, 48 FR 10226, Mar. 10, 1983]

§ 172.312 Liquid hazardous materials.

(a) Except as provided in this section, each package having an inside packaging containing liquid hazardous materials must be:

(1) Packed with closures upward, and

(2) Legibly marked "THIS SIDE UP" or "THIS END UP" as appropriate, to indicate the upward position of the inside packaging.

(b) Except as otherwise prescribed in Part 173 of this subchapter cylinders of liquefied compressed gas and specification containers 6D, 37M, 37P, and 21P are not required to be marked "THIS SIDE UP" or "THIS END UP".

(c) Arrows for purposes other than indicating proper package orientation may not be displayed on a package containing a hazardous material that is a liquid.

(1) An arrow symbol indicating "This Way Up" as specified in ANSI MH6.11968 entitled "Pictorial Marking for Handling of Goods" should be used in addition to the marking required by this section and § 173.25 of this subchapter.

(d) Except when offered for transportation by air, packages containing flammable liquids in inside packagings of one quart or less prepared in accordance with §§ 173.118(a) or 173.1200(a)(1) of this subchapter are excepted from the requirements of paragraph (a) of this section.

(e) When offered for transportation by air, packages containing flammable liquids in inside packagings of one quart or less prepared in accordance with §§ 173.118(a) or 173.1200(a)(1) of this subchapter are excepted from the requirements of paragraph (a) of this section when packed with sufficient absorption material between the inner and outer packagings to completely absorb the liquid contents.

[Amdt. 172-29, 41 FR 15996, Apr. 15, 1976, amended by Amdt. 172-29A, 41 FR 40678, Sept. 20, 1976; Amdt. 172-29B, 41 FR 57067, Dec. 30, 1976; Amdt. 173-135, 45 FR 13090, Feb. 28, 1980; Amdt. 172-62, 45 FR 68654, Oct. 16, 1980]

§ 172.316 Packagings containing material classed as ORM.

(a) Each packaging having a rated capacity of 110 gallons or less and containing a material classed as ORM-A, B, C, D, or E must be plainly, durably, and legibly marked on at least one side or end with the appropriate ORM designation immediately following or below the proper shipping name of the material. The appropriate ORM designation must be placed within a rectangle that is approximately ¼ inch (6.3 mm.) larger on each side than the designation. The appropriate designation for each ORM must be:

(1) ORM-A for an ORM-A.

(2) ORM-B-KEEP DRY for an ORM-B that is a solid and is corrosive only to aluminum when wet.

(3) ORM-B for an ORM-B other than that described in paragraph (a)(2) of this section.

(4) ORM-C for an ORM-C.

(5) ORM-D-AIR for an ORM-D that is prepared for air shipment and packaged in accordance with the provisions of § 173.6 of this subchapter.

(6) ORM-D for an ORM-D other than that described in paragraph (a)(5) of this section.

(7) ORM-E for an ORM-E.

(b) When the ORM-D marking including the proper shipping name can not be affixed on the package surface, it may be on an attached tag.

(c) The marking ORM-A, B, C, D, or E is the certification by the person offering the package for transportation that the material is properly described, classed, packaged, marked and labeled (when appropriate) and in proper condition for transportation according to the applicable regulations of this subchapter. This form of certification does not preclude the requirement for a certificate on a shipping paper when required by Subpart C of this part.

[Amdt. 172-29, 41 FR 15996, Apr. 15, 1976]

EDITORIAL NOTE: For Federal Register citations affecting § 172.316, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 172.324 Hazardous substances.

(a) If the proper shipping name for a mixture or solution that is a hazardous substance does not identify the constituents making it a hazardous substance, the name or names of such hazardous substance constituents as shown in § 172.101 shall be entered in association with the proper shipping name on each packaging having a capacity of 110 gallons or less. This requirement also applies when descriptions from the Optional Table in § 172.102 are used.

(b) The letters RQ shall be displayed in association with the proper shipping name on a packaging having a capacity of 110 gallons or less that contains a hazardous substance.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt 172-101, 45 FR 74666, Nov. 10, 1980, as amended by Amdt. 172-85, 48 FR 50459, Nov. 1, 1983]

§ 172.326 Portable tanks.

(a) No person may offer for transportation or transport a portable tank containing a hazardous material unless it is legibly marked with letters or numerals, as required, measuring no less than two inches (50.8 mm.) in height:

(1) On two opposing sides with the proper shipping name of the material, and

(2) As prescribed by § 172.332, with the identification number specified for the material in § 172.101 or § 172.102, (when authorized), and

(i) On each side and each end, if the tank has a capacity of 1,000 gallons or more, or

(ii) On two opposing sides in association with the proper shipping name, if the tank has a capacity of less than 1,000 gallons.

(b) A portable tank marked with the name or identification number of a hazardous material may not be used to transport any other material unless the marking is removed, or changed to identify the hazardous material in the portable tank, whichever is appropriate.

(c) The name of the owner, or when appropriate, of the lessee, must be legibly displayed on a portable tank that contains a hazardous material.

(d) If the marking required by paragraph (a)(2) of this section is not visible, a transport vehicle, or freight container used to transport a portable tank must be marked on each side and each end as required by § 172.332 with the identification number specified for the material in § 172.101 or § 172.102 (when authorized),

(e) Each portable tank marked as required by paragraph (a) of this section must remain marked unless it is:

(1) Filled with a material not subject to this subchapter; or

(2) Sufficiently cleaned of residue and purged of vapor to remove any potential hazard.

[Amdt. 172-29, 41 FR 15996, Apr. 15, 1976, as amended by Amdt. 172-58, 45 FR 34699, May 22, 1980; Amdt. 172-101, 45 FR 74666, Nov. 10, 1980]

§ 172.328 Cargo tanks.

(a) Except as provided in this subpart, no person may offer for transportation or transport a hazardous material in a cargo tank unless the cargo tank is marked as required by § 172.332 on each side and each end with the identification number specified for the material in § 172.101 or § 172.102 (when authorized).

(1) A person who offers a motor carrier a hazardous material for transportation in a cargo tank shall provide

the motor carrier the required identification numbers on placards or shall affix orange panels containing the required identification numbers, prior to or at the time the material is offered for transportation unless the cargo tank is already marked with the identification number required by this subpart in accordance with paragraph (f) of this section and § 173.29(c) of this subchapter.

(2) A person who offers a cargo tank containing a hazardous material for transportation shall affix the required identification numbers on panels or placards prior to or at the time the cargo tank is offered for transportation unless it is already marked with identification numbers as required by this subpart.

(b) When the name of a material is required by this subchapter to be marked on a cargo tank, it must be legibly displayed on each end and each side in lettering no less than two inches (50.8 mm.) in height.

(c) *Required markings: Gases.* Each cargo tank transporting flammable or nonflammable gas (including a cryogenic liquid) subject to this subchapter must be marked as specified in this part on each end and each side with:

(1) The proper shipping name of the gas, or

(2) An appropriate common name for the material such as "Refrigerant Gas."

(d) *QT/NQT marking for MC 330 and MC 331 cargo tanks.* Each specification MC 330 and MC 331 cargo tank must be appropriately marked "QT" or "NQT" to indicate it is constructed of quenched and tempered steel (QT) or other than quenched and tempered steel (NQT). These markings must be placed near the specification identification plate letters no less than two inches (50.8 mm.) in height.

(e) A cargo tank marked with the name or identification number of a hazardous material may not be used to transport any other material unless the marking is removed, or changed to identify the hazardous material in the cargo tank, whichever is appropriate.

(f) A cargo tank that is required to be marked with the name or identification number of a hazardous material must remain marked when empty unless it is:

(1) Reloaded with a material not subject to this subchapter; or

(2) Sufficiently cleaned of residue and purged of vapor to remove any potential hazard.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 172-29B, 41 FR 57067, Dec. 30, 1976, as amended by Amdt. 172-58, 45 FR 34699, May 22, 1980; Amdt. 172-101, 45 FR 74666, Nov. 10, 1980; Amdt. 172-82, 48 FR 27691, June 16, 1983; Amdt. 172-85, 48 FR 50440, Nov. 1, 1983]

§ 172.330 Tank cars and multi-unit tank car tanks.

(a) No person may offer for transportation or transport a hazardous material in a tank car (other than a multi-unit tank car tank) unless the tank car is:

(1) Marked on each side, when required by Part 173 or 179 of this subchapter, with the:

(i) Proper shipping name of the material, or

(ii) Common name authorized in this subchapter for the material such as "Refrigerant Gas."

(2) Marked on each side and each end, as required by § 172.332, with the identification number specified for the material in § 172.101 or § 172.102 (when authorized).

(b) The letters in the marking of a proper shipping name or common name must be 4 inches (101.6 mm.) or more in height with at least a 5/8 inch (15.9 mm.) stroke. The separation between each letter must be at least 3/4 inch (19.0 mm.).

(c) No person may offer for transportation or transport a hazardous material in a multi-unit tank car tank unless it is marked on opposing sides, in letters and numerals no less than two inches high, with the:

(1) Proper shipping name specified for the material in § 172.101 or § 172.102, or common name authorized for the material in this subchapter, and

(2) Identification number specified for the material in § 172.101 or § 172.102 (when authorized).

(d) A tank car or a multi-unit tank car tank marked with the identification number or name of a hazardous material may not be used to transport any other material unless the marking is removed, or changed to identify the hazardous material that the tank car or multi-unit tank car tank contains, whichever is appropriate.

(e) A motor vehicle or rail car used to transport a multi-unit tank car tank must be marked on each side and each end, as required by § 172.332, with the identification number specified for the material in § 172.101 or § 172.102 (when authorized).

(f) If a multi-unit tank car tank contains chlorine, marking of the name "Chlorine" is not required when the CHLORINE label is used as provided in § 172.405(b).

(g) Each multi-unit tank car tank and each tank car (except when it contains a combustible liquid) must remain marked when empty unless:

(1) Reloaded with a material not subject to this subchapter, or

(2) Sufficiently cleaned of residue and purged of vapor to remove any potential hazard.

[172-58, 45 FR 34699, May 22, 1980, as amended by Amdt. 172-101, 45 FR 74667, Nov. 10, 1980; Amdt. 172-85, 48 FR 50459, Nov. 1, 1983]

§ 172.332 Identification number markings.

(a) *General.* When required by §§ 172.326, 172.328, 172.330 of this subpart, identification numbers shall be displayed on orange panels or placards as specified in this section.

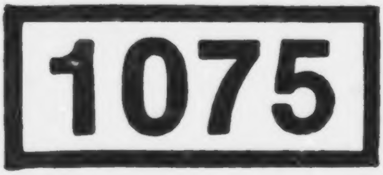
(b) *Orange panels.* Display of an identification number on an orange panel shall be in conformance with the following:

(1) The orange panel must be 6¼ inches (16 cm.) high by 15¾ inches (40 cm.) wide with a 9/16 inch (15 mm.) black outer border. The identification number shall be displayed in 4-inch (10 cm.) black Helvetica Medium numerals on the orange panel. Measurements may vary from those specified plus or minus 0.2 of an inch (5 mm.).

(2) The orange panel may be made of any durable material prescribed for placards in § 172.519, and shall be of the orange color specified for labels or placards in Appendix A to this part.

(3) The name and hazard class of a material represented by the identification number may be shown in the upper left border of the orange panel in letters not more than ¼ inch (18 points) high.

(4) Except for size and color, the orange panel and identification numbers shall be as illustrated for Liquefied petroleum gas:



(c) *Placards.* Display of an identification number on a hazard warning placard shall be in conformance with the following:

(1) The identification number shall be displayed across the center area of the placard in 3½ inch (89 mm.) black Alpine Gothic or Alternate Gothic No. 3 numerals on a white background 4 inches (10 cm.) high and approximately 8½ inches (21.5 cm.) wide.

(2) The top of the 4-inch (10 cm.) high white background shall be approximately 1⅝ inches (40.0 mm.) above the placard horizontal center line.

(3) When an identification number is displayed on a placard the United Nations hazard class number for the material shall be displayed in the lower corner of each placard as specified in § 172.519(d).

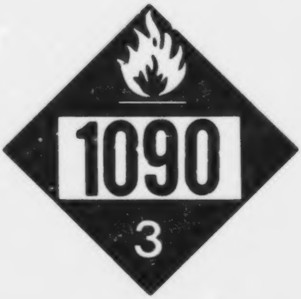
(4) For a COMBUSTIBLE placard used to display an identification number, the entire background below the white background for the identification number must be white during transportation by rail and may be white during transportation by highway.

(5) The name of the hazardous material and the hazard class may be shown in letters not more than ¼ inch (18 points) high immediately within the upper border of the space on the placard bearing the identification number of the material.

(6) If an identification number is placed over the word(s) on a placard,

the word(s) should be substantially covered to maximize the effectiveness of the identification number.

(d) Except for size and color, the display of an identification number on a placard shall be as illustrated for Acetone:



(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 172-101, 45 FR 74667, Nov. 10, 1980, as amended by Amdt. 172-81, 48 FR 28099, June 20, 1983; Amdt. 172-85, 48 FR 50459, Nov. 1, 1983]

§ 172.334 Identification numbers; prohibited display.

(a) An identification number may not be displayed on a POISON GAS, RADIOACTIVE or EXPLOSIVES placard.

(b) An identification number may not be displayed on an orange panel or a placard affixed to any package, freight container or transport vehicle that does not contain a hazardous material associated with that identification number in § 172.101 or § 172.102 (when authorized).

(c) Except as required by § 172.332(c)(4) for a combustible liquid, the identification number of a material may not be displayed on a placard other than the one required by Subpart F of this part for the material.

(d) Except as provided in § 172.336, a placard bearing an identification number may not be used to meet the requirements of Subpart F of this part unless it is the correct identification number for all hazardous materials of the same class in the transport vehicle or freight container on which it is displayed.

(e) Except as specified in § 172.338, an identification number may not be displayed on an orange panel on a cargo tank unless affixed to the cargo tank by the person offering the hazardous material for transportation in the cargo tank.

(f) If a placard is required by § 172.504, an identification number may not be displayed on an orange panel unless it is displayed in proximity to the placard.

[Amdt. 172-101, 45 FR 74667, Nov. 10, 1980]

§ 172.336 Identification numbers; special provisions and exceptions.

(a) When not required or prohibited by this subpart, identification numbers may be displayed on a transport vehicle or a freight container in the manner prescribed by this subpart.

(b) For hazardous materials in hazard classes for which placards are not required, identification numbers may be displayed on a plain white square-on-point configuration having the same outside dimensions as those prescribed by this part for placards. An identification number displayed as authorized by this paragraph is not considered a placard.

(1) The 4-inch (10 cm.) by 8½ inch (21.5 cm.) area containing the identification number shall be located as prescribed by § 172.332 (c)(1) and (c)(2) and may be outlined with a solid or dotted line border.

(c) Identification numbers are not required:

(1) On the ends of a portable tank, cargo tank or tank car having more than one compartment if hazardous materials having different identification numbers are being transported therein. In such a circumstance, the identification numbers on the sides of the tank shall be displayed in the same sequence as the compartments containing the materials they identify.

(2) On a cargo tank containing only gasoline, if the cargo tank is marked "Gasoline" on each side and rear in letters no less than 2 inches high, or is placarded in accordance with § 172.542(c).

(3) On a cargo tank containing only fuel oil, if the cargo tank is marked "Fuel Oil" on each side and rear in letters no less than 2 inches high, or is placarded in accordance with § 172.544(c).

(4) For different liquid distillate fuels, including gasoline, in a compartmented cargo tank or tank car, if the identification number is displayed for the distillate fuel having the lowest flash point.

(5) For each of the different liquid distillate fuels, including gasoline, transported in a cargo tank, if the identification number is displayed for the liquid distillate fuel having the lowest flash point.

(6) On nurse tanks meeting the provisions of § 173.315(m) of this subchapter.

[Amdt. 172-101, 45 FR 74667, Nov. 10, 1980, as amended by Amdt. 172-71, 46 FR 50801, Oct. 15, 1981; Amdt. 172-74, 47 FR 40365, Sept. 30, 1982; Amdt. 172-85, 48 FR 50459, Nov. 1, 1983]

§ 172.338 Replacement of identification numbers.

If more than one of the identification number markings on the placards or orange panels that are required to be displayed are lost or destroyed during transportation, the carrier shall replace all the missing identification number(s) as soon as practicable. However, in such a case, the numerals may be entered legibly by hand using an indelible marking material. This section does not preclude required compliance with the placarding requirements of this subchapter.

[Amdt. 172-101, 45 FR 74668, Nov. 10, 1980]

Subpart E—Labeling

§ 172.400 General labeling requirements.

(a) Except as otherwise provided in this subchapter, each person who offers a package, overpack, or freight container containing a hazardous material for transportation shall label it, when required, with labels prescribed for the material as specified in § 172.101 or § 172.102 (when authorized) and in accordance with this subpart.

(b) A label is not required on a:

(1) Package for which labeling is not required under the conditions set forth in this subchapter and in this section;

(2) Cylinder containing a compressed gas classed as flammable or nonflammable that is:

(i) Carried by a private or contract motor carrier;

(ii) Not overpacked; and

(iii) Durably and legibly marked in accordance with CGA Pamphlet C-7, Appendix A.

(3) Package or unit of military explosives (including ammunition) shipped by or on behalf of the DOD when in (i) freight containerload, carload or truckload shipments, if loaded and unloaded by the shipper or DOD or (ii) unitized or palletized break bulk shipments by cargo vessel under charter to DOD if at least one required label is displayed on each unitized or palletized load.

(4) Package containing a hazardous material other than ammunition that is:

(i) Loaded and unloaded under the supervision of DOD personnel, and

(ii) Escorted by DOD personnel in a separate vehicle.

(5) Compressed gas cylinder permanently mounted in or on a transport vehicle;

(6) Portable tank which is placarded in accordance with § 172.514;

(7) Freight container having a volume of 640 cubic feet or more which is subject to § 172.512;

(8) Package containing a material classed as ORM-A, B, C, D, or E if that package does not contain any other material classed as a hazardous material that requires labeling.

(9) Package containing a combustible liquid; or

(10) Package of low specific activity radioactive material, when being transported in a conveyance assigned for exclusive use of the consignor under § 173.425(b) of this subchapter.

(11) Cargo tank or tank car other than a multi-unit tank car tank.

(c) Provisions of paragraph (b) of this section, do not apply to the CARGO AIRCRAFT ONLY label or the MAGNETIZED MATERIAL label.

(d) Except as provided in paragraph (b) of this section, when the proper shipping name marked on a package is a proper shipping name from § 172.102 that does not appear in § 172.101, the package must be labeled as provided in § 172.102.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 172-29, 41 FR 15996, Apr. 15, 1976, as amended by Amdt. 172-29A, 41 FR 40679, Sept. 20, 1976; Amdt. 172-29B, 41 FR 57067, Dec. 30, 1976; Amdt. 172-58, 45 FR 34701, May 22, 1980; Amdt. 172-101, 45 FR 74668, Nov. 10, 1980; Amdt. 172-78, 48 FR 10226, Mar. 10, 1983; Amdt. 172-81, 48 FR 28099, June 20, 1983; 48 FR 31217, July 7, 1983]

§ 172.401 Prohibited labeling.

(a) Except as provided in paragraphs (c) and (d) of this section, no person may offer for transportation and no carrier may transport any package bearing a label specified in this subpart unless:

(1) The package contains a material that is a hazardous material, and

(2) The label represents a hazard of the hazardous material in the package.

(b) No person may offer for transportation and no carrier may transport a package bearing any marking or label which by its color, design, or shape could be confused with or conflict with a label prescribed by this part.

(c) The restrictions in paragraphs (a) and (b) of this section, do not apply to packages labeled in conformance with:

(1) Any United Nations recommendation, including the class number (see § 172.407), in the document entitled *"Transport of Dangerous Goods."*;

(2) The International Maritime Organization (IMO) requirements, including the class number (see § 172.407), in the document entitled "International Maritime Dangerous Goods Code";

(3) The ICAO Technical Instructions; or

(4) The TDG Regulations.

(d) A package containing a sample of a hazardous material, other than an explosive, must be labeled in accordance with § 172.402(h).

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 172-9, 41 FR 15996, Apr. 15, 1976, as amended by Amdt. 172-75, 47 FR 44471, Oct. 7, 1982; Amdt. 172-77, 47 FR 54822, Dec. 6, 1982; Amdt. 172-94, 49 FR 38134, Sept. 27, 1984; Amdt. 172-100, 50 FR 41521, Oct. 11, 1985]

§ 172.402 Additional labeling requirements.

(a) *Multiple labeling.* Each package containing a material meeting the definition of more than one hazard class must be labeled as follows:

(1) A material classed as an Explosive A, Poison A, or Radioactive material that also meets the definition of another hazard class, must be labeled as required for each class.

(2) A Poison B liquid that also meets the definition of a Flammable liquid must be labeled POISON and FLAMMABLE LIQUID.

(3) A material classed as Oxidizer, Flammable solid or Flammable liquid that also meets the definition of a Poison B must be labeled POISON in addition to the class label.

(4) A material classed as a Flammable solid that also meets the definition of a water reactive material must have both the FLAMMABLE SOLID and DANGEROUS WHEN WET labels affixed.

(5) A material classed as a Corrosive material that also meets the definition of a Poison B shall be labeled with a POISON label in addition to the class label. This subparagraph does not apply to a material that would cause death due to corrosive destruction of tissue rather than by systemic poisoning.

(6) A material classed as a Poison B that also meets the definition of a corrosive material shall be labeled with a CORROSIVE label in addition to the class label.

(7) A material classed as a Flammable liquid that also meets the definition of a Corrosive material shall be labeled with a CORROSIVE label in addition to the class label.

(8) A material classed as a Flammable solid that also meets the definition of a Corrosive material shall be labeled with a CORROSIVE label in addition to the class label.

(9) A material classed as an Oxidizer that also meets the definition of a

Corrosive material shall be labeled with a CORROSIVE label in addition to the class label.

(10) A material falling within the inhalation hazard criteria described in § 173.3a(b)(2) shall be labeled with a POISON label in addition to any other label(s) required by this section. Duplication of the POISON label is not required.

(b) *CARGO AIRCRAFT ONLY label.* Each person who offers for transportation by air a package containing a hazardous material authorized only on cargo aircraft shall affix to the package a CARGO AIRCRAFT ONLY label which is described in § 172.448.

(c) *DANGEROUS WHEN WET label.* Each person who offers for transportation a package containing a hazardous material must affix to the package a DANGEROUS WHEN WET label as described in § 172.423 when required by § 172.101.

(d) *MAGNETIZED MATERIAL label.* Each person who offers for transportation by air a package meeting the definition of a magnetized material in § 173.1020 of this subchapter must affix to the package a MAGNETIZED MATERIAL label as required by § 172.101 and described in § 172.446.

(e) *BUNG label.* Each metal barrel or drum containing a flammable liquid having a vapor pressure between 16 and 40 p.s.i.a. at 100° F. must have affixed a BUNG label as specified in § 173.119(i) of this subchapter in addition to a FLAMMABLE LIQUID label described in § 172.419.

(f) *ETIOLOGIC AGENTS label.* See § 172.444 and § 173.388 of this subchapter for ETIOLOGIC AGENTS labeling requirements.

(g) *EMPTY label.* See § 173.29 of this subchapter for EMPTY labeling requirements.

(h) *Packages containing samples.* Except as provided in §§ 173.21 and 173.86 of this subchapter, a material for which a reasonable doubt exists as to its class and labeling requirements, and for which a sample must be transported for laboratory analysis may be labeled according to the shipper's tentative class assignment based upon:

(1) Defining criteria in this subchapter;

(2) The hazard precedence prescribed in § 173.2 of this subchapter; and

(3) The shipper's knowledge of the material.

(i) *Labels for DOT specification 106 and 110 tanks.* A DOT specification 106 or 110 tank must be labeled on each end as required by this subchapter for the hazardous material it contains.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 172-29, 41 FR 15996, Apr. 15, 1976, as amended by Amdt. 172-29A, 41 FR 40679, Sept. 20, 1976; Amdt. 172-58, 45 FR 34701, May 22, 1980; Amdt. 172-85, 48 FR 50459, Nov. 1, 1983; Amdt. 172-99, 50 FR 41096, Oct. 8, 1985]

EFFECTIVE DATE NOTE: Section 172.402 was amended at 50 FR 41096, Oct. 8, 1985, by adding paragraph (a)(10), effective January 1, 1986.

§ 172.403 Radioactive material.

(a) Unless excepted from labeling by §§ 173.421 through 173.425 of this subchapter, each package of radioactive material must be labeled as provided in this section.

(b) The proper label to affix to a package of radioactive material is based on the radiation level at the surface of the package, the transport index (§ 173.403 of this subchapter) and, if appropriate, the fissile characteristics of the package. The proper category of label shall be determined in accordance with paragraph (c) of this section. The label to be applied shall be the highest category required for any of the three determining conditions for the package. Radioactive White-I is the lowest category and Radioactive Yellow-III is the highest. For example: a package with a transport index of 0.8 and a maximum surface radiation level of 60 millirem per hour which contains no fissile material must bear a Radioactive Yellow-III label.

(c) Category of Label to be Applied to Radioactive Materials Packages:

Transport index (T.I.)	Radiation level at package surface (RL)	Fissile criteria	Label category.[1]
N/A	$RL \leq 0.5$ millirem per hour (mrem/h).	Fissile class I only, no fissile class II or III.	White-[1].
$T.I. \leq 1.0$	0.5 mrem/$h < RL \leq 50$ mrem/h.	Fissile class I, fissile class II, with $T.I. \leq 1.0$, no fissile class III.	Yellow-II
$1.0 < T.I.$	50 mrem/$h < RL$	Fissile class II with $1.0 < T.I.$, fissile class III.	Yellow-III.

[1] Any package containing a "highway route controlled quantity" (§ 173.403 of this subchapter) must be labeled as Radioactive Yellow-III.

(d) [Reserved]

(e) Each package containing a radioactive material that also meets the definition of one or more additional hazards must be labeled as a radioactive material as required by this section and for each additional hazard. For example:

(1) Packages containing the solid nitrates of uranium or thorium must be labeled RADIOACTIVE and OXIDIZER.

(2) Packages containing nitric acid solutions of radioactive material must be labeled RADIOACTIVE and CORROSIVE.

(f) Each package required by this section to be labeled with a RADIOACTIVE label must have two of these labels, affixed to opposite sides of the package. (See § 172.406(e)(3) for freight container label requirements).

(g) The following applicable items of information must be entered in the blank spaces on the RADIOACTIVE label by legible printing (manual or mechanical), using a durable weather resistant means of marking:

(1) "Contents." The name of the radionuclides as taken from the listing of radionuclides in § 173.435, of this subchapter (symbols which conform to established radiation protection terminology are authorized, i.e., ^{99}Mo, ^{60}Co, etc.). For mixtures of radionuclides, the most restrictive radionuclides on the basis of radiotoxicity must be listed as space on the label allows.

(2) "Activity." Units shall be expressed in appropriate curie units, i.e., curies (Ci), millicuries (mCi) or microcuries (uCi) (abbreviations are authorized). For a fissile material, the weight in grams or kilograms of the fissile radioisotope also may be inserted.

(3) "Transport index." (See § 173.403 of this subchapter.)

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 172-29, 41 FR 15996, Apr. 15, 1976, as amended by Amdt. 172-29A, 41 FR 40679, Sept. 20, 1976; Amdt. 172-60, 45 FR 49940, July 28, 1980; Amdt. 172-78, 48 FR 10226, Mar. 10, 1983; 48 FR 13431, Mar. 31, 1983; 48 FR 31217, July 7, 1983; Amdt. 172-85, 48 FR 50459, Nov. 1, 1983]

§ 172.404 Labels for mixed and consolidated packaging.

(a) *Mixed packaging.* When hazardous materials having different hazard classes are packed within the same packaging, or within the same outside container or overpack as described in § 173.25 and authorized by § 173.21 of this subchapter, the packaging, outside container or overpack must be labeled as required for each class of hazardous material contained therein.

(b) *Consolidated packaging.* When two or more packages containing compatible hazardous material (see § 173.21 of this subchapter) are placed within the same outside container or overpack, the outside container or overpack must be labeled as required for each class of hazardous material contained therein.

§ 172.405 Authorized label modifications.

(a) For a package containing Oxygen, the word "OXYGEN" may be used in the place of the word "OXIDIZER" on the OXIDIZER label provided the letter size and color for OXYGEN are the same as those required for OXIDIZER.

(b) For a package containing Chlorine, the word "CHLORINE" may be used in the place of the word "POISON" on the POISON label provided the letter size and color for CHLORINE are the same as those required for POISON; (1) A CHLORINE label may be used in place of the NON-FLAMMABLE GAS and

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POISON labels required for Chlorine by § 172.101.

[Amdt. 172-29, 41 FR 15996, Apr. 15, 1976, as amended by Amdt. 172-29A, 41 FR 40679, Sept. 20, 1976]

§ 172.406 Placement of labels.

(a) *General.* Except as provided in paragraphs (b) and (e) of this section, each label required by this subpart must be printed on or affixed to the surface of the package near the marked proper shipping name required by Subpart D of this part.

(b) *Exceptions.* Labels may be printed on or placed on a securely affixed tag, or may be affixed by other suitable means to:

(1) A package that contains no radioactive material and which has dimensions less than those of the required label;

(2) A compressed gas cylinder; and

(3) A package which has such an irregular surface that a label cannot be satisfactorily affixed.

(c) *Placement of multiple labels.* When two or more different labels are required, they must be displayed or affixed next to each other.

(d) *Label border.* Each label must be affixed to a background of contrasting color, or must have a dotted or solid line outer border.

(e) *Additional labeling.* When labeling is required, the labels must be displayed on at least two sides or two ends (excluding the bottom) of:

(1) Each package containing a radioactive material;

(2) Each package having a volume of 64 cubic feet or more; and

(3) Each freight container having a volume of 64 cubic feet or more, but less than 640 cubic feet, except when placarded in accordance with § 172.512(b).

(i) Placarding may not be used instead of labeling on a package containing radioactive material.

(ii) When labeled, one of each of the appropriate labels must be displayed on or near the closure.

(4) Each portable tank having a rated capacity of less than 1,000 gallons, except when placarded in accordance with § 172.514(a).

(f) *Obscured labels.* A label must not be obscured by markings or attachments.

[Amdt. 172-29, 41 FR 15996, Apr. 15, 1976, as amended by Amdt. 172-29A, 41 FR 40679, Sept. 20, 1976; Amdt. 172-29B, 41 FR 57067, Dec. 30, 1976]

§ 172.407 Label specifications.

(a) Each label, affixed to or printed on a package must be durable and weather resistant. Black and any color on a label must be able to withstand, without substantial change:

(1) A 72-hour fadeometer test (for a description of equipment designed for this purpose, see ASTM G 23-69 (1975), or ASTM G 26-70); and

(2) A 30-day exposure to conditions incident to transportation that reasonably could be expected to be encountered by the labeled package.

(b) Each diamond (square-on-point) label prescribed in this part must be at least 4 inches (101 mm.) on each side with each side having a black solid line border ¼-inch (6.3 mm.) from the edge.

(c) Except for size and color, the printing, inner border, and symbol on each label must be as shown for each label.

(d) A color on a label, upon visual examination, must fall within the color tolerances displayed on the appropriate Office of Hazardous Materials Label and Placard Color Tolerance Chart.

(1) A set of six charts, dated January 1973, for comparison with labels and placards surfaced with paint, lacquer, enamel, plastic or other opaque coatings, or ink, may be purchased from the Office of Hazardous Materials Regulation, U.S. Department of Transportation, Washington, D.C. 20590, for $5.50.

(2) A set of six charts, dated January 1974, for comparison with labels and placards surfaced with ink, may be similarly purchased for $12.50.

(3) Both sets of charts may be inspected in Room 8426, Nassif Building, 400 7th Street S.W., Washington, D.C. 20590, or any of the offices of the Federal Highway Administration listed at 49 CFR 390.40.

(4) The technical specifications for each chart are set forth in Appendix A to this part.

(e) The specified label color must extend to the edge of the label in the area designated on each label except the CORROSIVE, MAGNETIZED MATERIAL, RADIOACTIVE YELLOW-II, and RADIOACTIVE YELLOW-III labels.

(f) A label may contain form identification information, including the name of its maker, provided that information is printed outside of the solid line inner border in no larger than 10-point type.

(g) A label may contain the UN and (IMO) hazard class number and, when appropriate, the division number. The number must be:

(1) Black, unless it is on a CORROSIVE label when it must be white, or unless other colors are authorized by this part.

(2) Located in the lower corner of the label, and

(3) One-half inch (12.7 mm.) or less in height.

(h) For import shipments only, a label conforming to the requirements of IMO or the United Nations Recommendations affixed to a package in another country may contain inscriptions required by the country of origin.

(i) The dotted line border shown on each label is not part of the label specification, except when used as an alternative for the solid line outer border to meet the requirements of § 172.406(d).

(j) EXPLOSIVE A, EXPLOSIVE B, and EXPLOSIVE C labels may bear inscriptions in addition to those prescribed in this subpart, if required for import or export purposes.

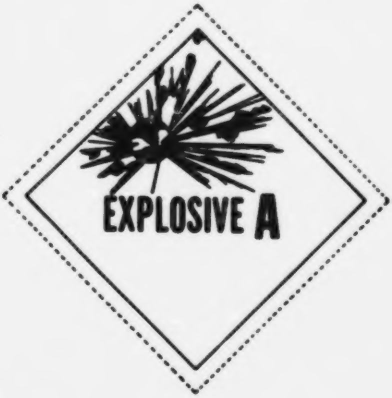
(49 U.S.C. 1808)

[Amdt. 172-29, 41 FR 15996, Apr. 15, 1976]

EDITORIAL NOTE: For Federal Register citations affecting § 172.407, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

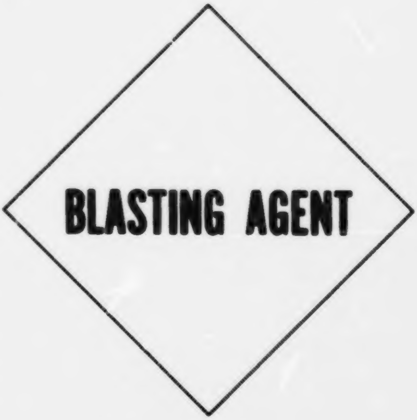
§ 172.411 EXPLOSIVE A, EXPLOSIVE B, EXPLOSIVE C, and BLASTING AGENTS labels.

(a) Except for size and color, the EXPLOSIVE A, EXPLOSIVE B, and EXPLOSIVE C labels must be as follows:



(b) In addition to complying with § 172.407, the EXPLOSIVE A, EXPLOSIVE B, and EXPLOSIVE C labels must be orange. The printing and symbol must be black.

(c) Except for size and color, the BLASTING AGENT label must be as follows:



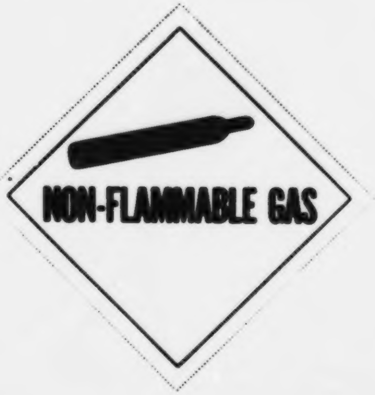
(d) In addition to complying with § 172.407, the BLASTING AGENT label must be orange. The printing must be black.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 172-29, 41 FR 15996, Apr. 15, 1976, as amended by Amdt. 172-48, 44 FR 31182, May 31, 1979]

§ 172.415 NON-FLAMMABLE GAS label.

(a) Except for size and color, the NON-FLAMMABLE GAS label must be as follows:

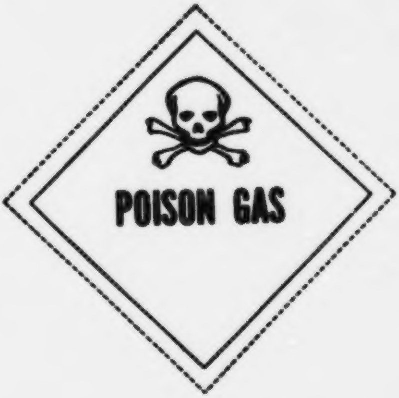


(b) In addition to the requirements specified in § 172.407, the NON-FLAMMABLE GAS label must be green. The symbol and inscription must be black or white. The solid line border and, if used, the hazard class number must be the color of the symbol.

[Amdt. 172-29, 41 FR 15996, Apr. 15, 1976, as amended by Amdt. 172-101, 45 FR 74668, Nov. 10, 1980]

§ 172.416 POISON GAS label.

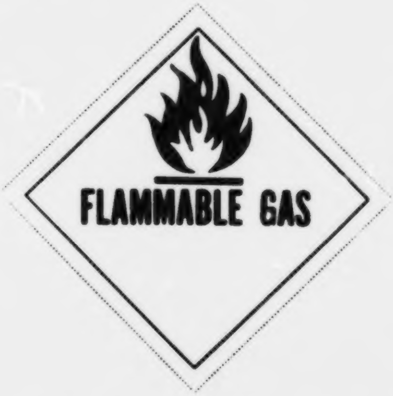
(a) Except for size and color, the POISON GAS label must be as follows:



(b) In addition to complying with § 172.407, the POISON GAS label must be white. The printing must be black, and the symbol must be black and white.

§ 172.417 FLAMMABLE GAS label.

(a) Except for size and color, the FLAMMABLE GAS label must be as follows:

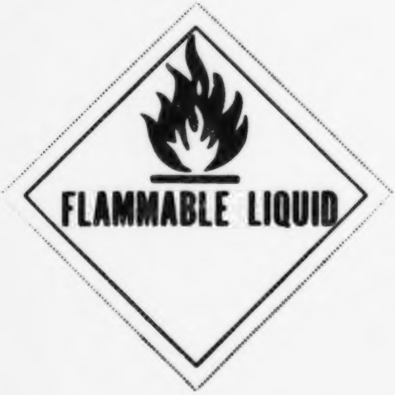


(b) In addition to complying with § 172.407, the FLAMMABLE GAS label must be red. The symbol and inscription must be black or white. The solid line border and, if used, the hazard class number must be the color of the symbol.

[Amdt. 172-29, 41 FR 15996, Apr. 15, 1976, as amended by Amdt. 172-101, 45 FR 74668, Nov. 10, 1980]

§ 172.419 FLAMMABLE LIQUID label.

(a) Except for size and color, the FLAMMABLE LIQUID label must be as follows:

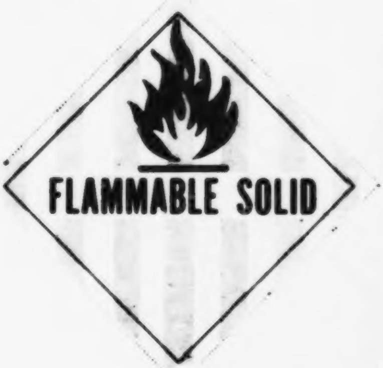


(b) In addition to complying with § 172.407, the FLAMMABLE LIQUID label must be red. The symbol and inscription must be black or white. The solid line border and, if used, the hazard class number must be the color of the symbol.

[Amdt. 172-29, 41 FR 15996, Apr. 15, 1976, as amended by Amdt. 172-101, 45 FR 74668, Nov. 10, 1980]

§ 172.420 FLAMMABLE SOLID label.

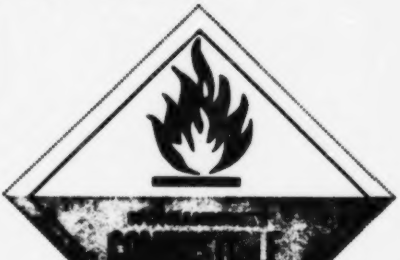
(a) Except for size and color, the FLAMMABLE SOLID label must be as follows:



(b) In addition to complying with § 172.407, the FLAMMABLE SOLID label must be white with vertical red stripes equally spaced on each side of a red strip in the center of the label. The rectangle for the words "FLAMMABLE SOLID" must be white. The printing and symbol must be black with the symbol overprinted. The words "FLAMMABLE SOLID" must not contact any red stripe. The white stripes must be sufficiently wider than the red stripes to make them appear visually equal in width.

§ 172.422 SPONTANEOUSLY COMBUSTIBLE label.

(a) Except for size and color, the SPONTANEOUSLY COMBUSTIBLE label must be as follows:

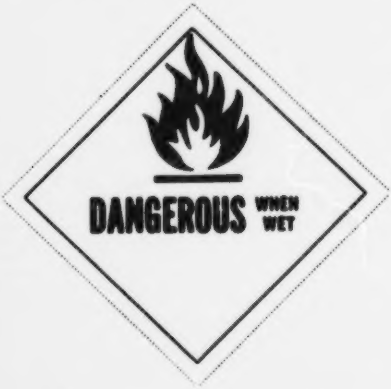


(b) In addition to complying with § 172.407, the SPONTANEOUSLY COMBUSTIBLE label must be red in the lower half and white in the upper half. The symbol and printing must be black.

(c) If use of the SPONTANEOUSLY COMBUSTIBLE label is required by the regulations of another country, it may be used in addition to the labels required by §§ 172.400 and 172.402.

§ 172.423 DANGEROUS WHEN WET label.

(a) Except for size and color, the DANGEROUS WHEN WET label must be as follows:



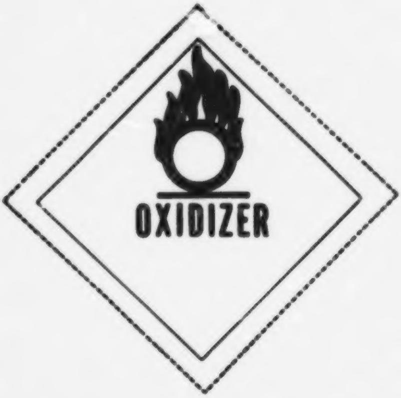
(b) In addition to complying with § 172.407, the DANGEROUS WHEN WET LABEL must be blue. The symbol and inscription must be black or white. The solid line border and, if used, the hazardous class number must be the color of the symbol.

(c) If use of the DANGEROUS WHEN WET label is required by the regulations of another country, it may be used in addition to the labels required by §§ 172.400 and 172.402.

[Amdt. 172-29, 41 FR 15996, Apr. 15, 1976, as amended by Amdt. 172-101, 45 FR 74668, Nov. 10, 1980]

§ 172.426 OXIDIZER label.

(a) Except for size and color, the OXIDIZER label must be as follows (see § 172.405 for authorized label modification):

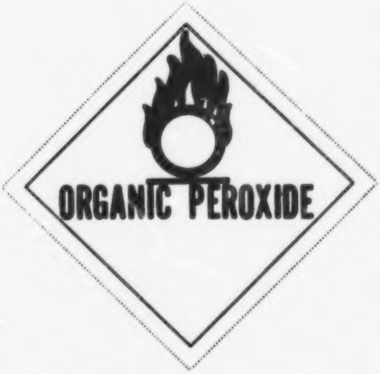


(b) In addition to complying with § 172.407, the OXIDIZER label must be yellow. The printing and symbol must be black.

[Amdt. 172-29, 41 FR 15996, Apr. 15, 1976, as amended by Amdt. 172-29A, 41 FR 40679, Sept. 20, 1976]

§ 172.427 ORGANIC PEROXIDE label.

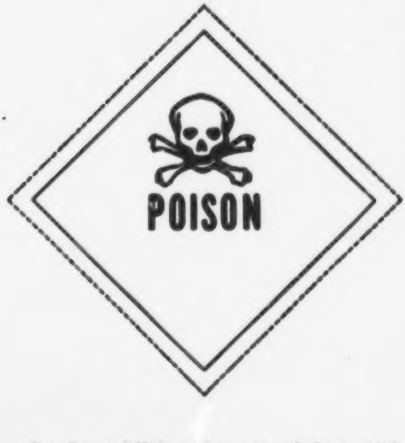
(a) Except for size and color, the ORGANIC PEROXIDE label must be as follows:



(b) In addition to complying with § 172.407, the ORGANIC PEROXIDE label must be yellow. The printing and symbol must be black.

§ 172.430 POISON label.

(a) Except for size and color, the POISON label must be as follows (see § 172.405 for authorized label modification):

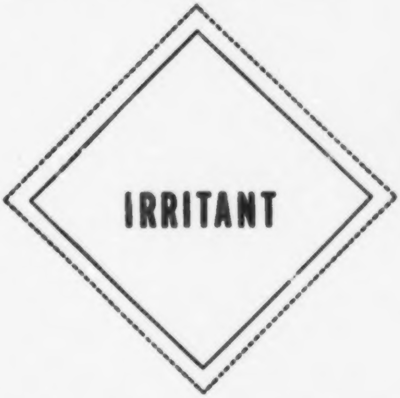


(b) In addition to complying with § 172.407, the POISON label must be white. The printing and symbol must be black.

[Amdt. 172-29, 41 FR 15996, Apr. 15, 1976, as amended by Amdt. 172-29A, 41 FR 40679, Sept. 20, 1976]

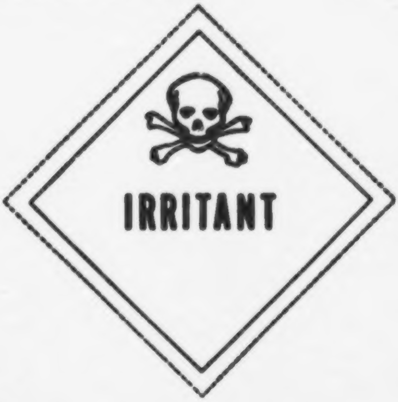
§ 172.432 IRRITANT label.

(a) Except for size and color, the IRRITANT label must be as follows:



(b) In addition to complying with § 172.407, the IRRITANT label must be white. The word "IRRITANT" must be red.

(c) For export shipments, if use of the following label is required for irritants by the regulations of another country, it may be used in place of the label for irritants required by § 172.400 and described in § 172.432. In addition to complying with § 172.407, this label for irritant, except for size and color, must be as follows:

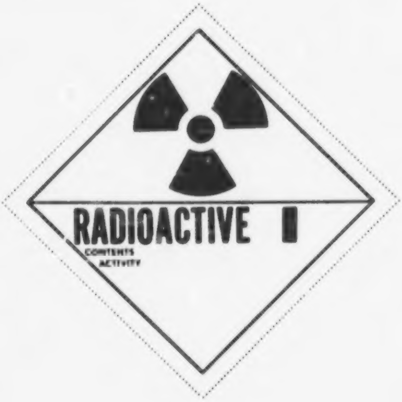


(d) The printing and symbol must be black on a white background.

[Amdt. 172-29, 41 FR 15996, Apr. 15, 1976, as amended by Amdt. 172-29A, 41 FR 40679, Sept. 20, 1976]

§ 172.436 RADIOACTIVE WHITE-I label.

(a) Except for size and color, the RADIOACTIVE WHITE-I label must be as follows:

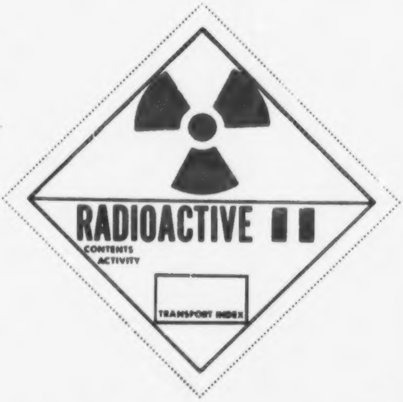


(b) In addition to complying with § 172.407, the RADIOACTIVE WHITE-I label must be white. The printing and symbol must be black except for the "I" which must be red.

[Amdt. 172-29, 41 FR 15996, Apr. 15, 1976, as amended by Amdt. 172-60 45 FR 49940, July 28, 1980]

§ 172.438 RADIOACTIVE YELLOW-II label.

(a) Except for size and color, the RADIOACTIVE YELLOW-II label, must be as follows:

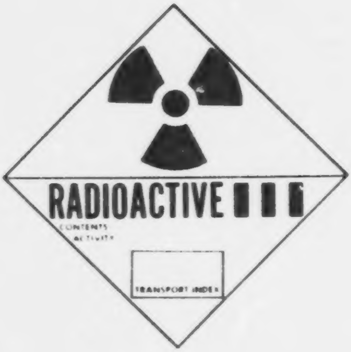


(b) In addition to complying with § 172.407, the RADIOACTIVE YELLOW-II label must be yellow in the top half and white in the lower half. The printing and symbol must be black, except for the "II" which must be red.

[Amdt. 172-29, 41 FR 15996, Apr. 15, 1976, as amended by Amdt. 172-60, 45 FR 49940, July 28, 1980]

§ 172.440 RADIOACTIVE YELLOW-III label.

(a) Except for the size and color, the RADIOACTIVE YELLOW-III label must be as follows:

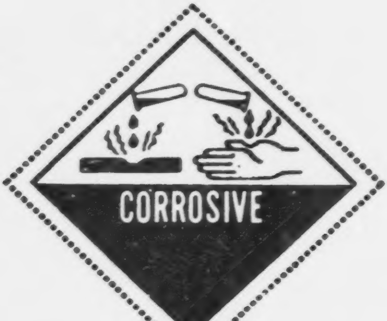

RADIOACTIVE III
CONTENTS
ACTIVITY
TRANSPORT INDEX

(b) In addition to complying with § 172.407, the RADIOACTIVE YELLOW-III label must be yellow in the top half and white in the lower half. The printing and symbol must be black, except for the "III" which must be red.

[Amdt. 172-29, 41 FR 15996, Apr. 15, 1976, as amended by Amdt. 172-60 45 FR 49940, July 28, 1980]

§ 172.442 CORROSIVE label.

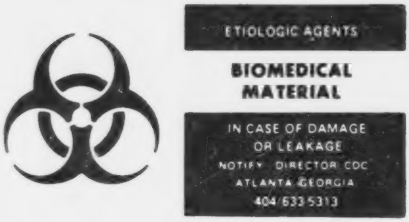
(a) Except for size and color, the CORROSIVE label must be as follows:



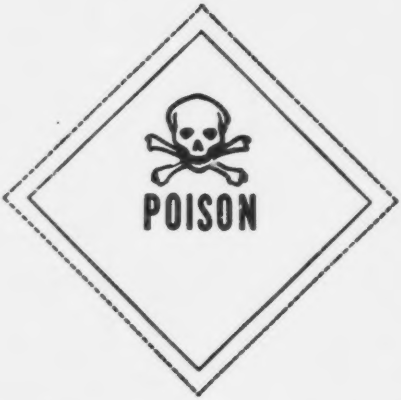
(b) In addition to complying with § 172.407, the CORROSIVE label must be white in the top half and black in the lower half. The printing must be white and the symbol must be black and white.

§ 172.444 ETIOLOGIC AGENT label.

(a) Each package containing an Etiologic agent subject to this subchapter must be labeled as specified in § 173.388 of this subchapter.


ETIOLOGIC AGENTS
BIOMEDICAL MATERIAL
IN CASE OF DAMAGE OR LEAKAGE
NOTIFY: DIRECTOR CDC
ATLANTA, GEORGIA
404/633-5313

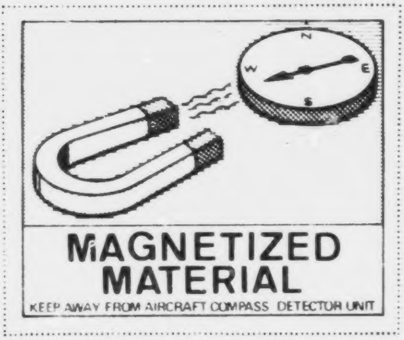
(b) For export shipments, if use of the following label is required by the regulations of another country, it may be used in addition to the label required in paragraph (a) of this section for Etiologic agents. In addition to complying with § 172.407, this additional label for Etiologic agents, except for size and color, must be as follows:



(c) The printing and symbol must be black on a white background.

§ 172.446 MAGNETIZED MATERIAL label.

(a) Except for size and color, the MAGNETIZED MATERIAL label must be as follows:


N
W
E
S
MAGNETIZED
MATERIAL
KEEP AWAY FROM AIRCRAFT COMPASS DETECTOR UNIT

(b) The MAGNETIZED MATERIAL label must be a rectangle measuring $3\frac{9}{16}$ inches (90 mm.) high and $4\frac{5}{16}$ inches (110 mm.) wide. The printing must be blue and the symbol must be white and blue.

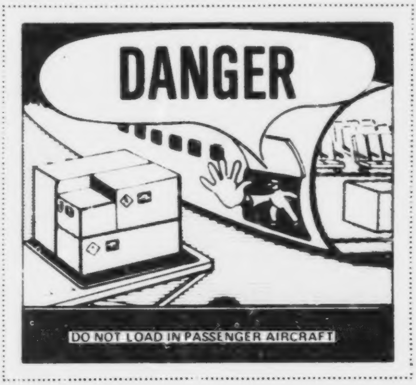
(c) MAGNETIZED MATERIAL labels with the text "MAGNETIZED MATERIAL LABEL" shown in the lower right corner of the label may continue to be used until stocks existing on January 1, 1983, are depleted.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 172-29, 41 FR 15996, Apr. 15, 1976, as amended by Amdt. 172-77, 47 FR 54822, Dec. 6, 1982]

§ 172.448 CARGO AIRCRAFT ONLY label.

(a) Except for size and color, the CARGO AIRCRAFT ONLY label must be as follows:


DANGER
DO NOT LOAD IN PASSENGER AIRCRAFT

(b) The CARGO AIRCRAFT ONLY label must be a rectangle measuring $4\frac{5}{16}$ inches (110 mm.) high by $4\frac{3}{4}$ inches (120 mm.) wide. The printing must be black and the symbol must be black and orange.

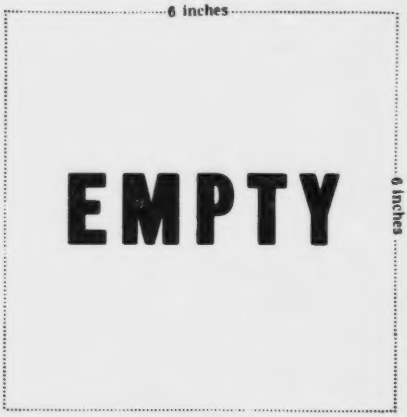
(c) CARGO AIRCRAFT ONLY labels with the text "DANGER-PELIGRO" may continue to be used until stocks existing on January 1, 1983, are depleted.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 172-29, 41 FR 15996, Apr. 15, 1976, as amended by Amdt. 172-77, 47 FR 54822, Dec. 6, 1982]

§ 172.450 EMPTY label.

(a) Each EMPTY label, except for size, must be as follows:



(1) Each side must be at least 6 inches (152 mm.) with each letter at least 1 inch (25.4 mm.) in height.

(2) The label must be white with black printing.

Subpart F—Placarding

§ 172.500 Applicability of placarding requirements.

(a) Each person who offers for transportation or transports any hazardous material subject to this subchapter shall comply with the applicable placarding requirements of this subpart.

(b) This subpart does not apply to:

(1) Etiologic agents,

(2) Hazardous materials classed as ORM-A, B, C, D, or E, or

(3) Hazardous materials authorized by this subchapter to be offered for transportation as Limited Quantities when identified as such on shipping papers in accordance with § 172.203(b).

[Amdt. 172-29, 41 FR 15996, Apr. 15, 1976, as amended by Amdt. 172-29A, 41 FR 40679, Sept. 20, 1976; Amdt. 172-101, 45 FR 74668, Nov. 10, 1980]

§ 172.502 Prohibited placarding.

(a) Except as provided in paragraph (c) of this section, no person may affix or display on a portable tank, freight container, motor vehicle or rail car any placard described in this subpart unless:

(1) The material being offered or transported is a hazardous material, and

(2) The placard represents a hazard of the hazardous material being offered or transported.

(b) No person may affix or display any sign or other device on a motor vehicle, rail car, portable tank, or freight container, that by its color, design, shape, or content could be confused with any placard prescribed in this subpart.

(c) The restrictions in paragraphs (a) and (b) of this section do not apply to portable tanks, freight containers, motor vehicles or rail cars which:

(1) In addition to any placards required by this part, may be placarded in conformance with the IMDG Code; or

(2) Are placarded in conformance with the TDG Regulations.

[Amdt. 172-29, 41 FR 15996, Apr. 15, 1976, as amended by Amdt. 172-61 45 FR 62081, Sept. 18, 1980; Amdt. 172-75, 47 FR 44471, Oct. 7, 1982; Amdt. 172-100, 50 FR 41521, Oct. 11, 1985]

§ 172.503 Identification number display on placards.

For procedures and limitations pertaining to the display of identification numbers on placards, see § 172.334.

[Amdt. 172-58, 45 FR 34701, May 22, 1980]

§ 172.504 General placarding requirements.

(a) Except as otherwise provided in this subchapter, each motor vehicle, rail car, and freight container containing any quantity of a hazardous material must be placarded on each end and each side with the type of placards specified in the following tables and other placarding requirements of this subpart, including the specifications for the placards named in the tables and described in detail in §§ 172.519 through 172.558.

(b) A freight container, motor vehicle, or rail car containing two or more classes of materials requiring different placards specified in Table 2 may be placarded DANGEROUS in place of the separate placarding specified for each of those classes of material specified in Table 2. However, when 5,000 pounds or more of one class of material is loaded therein at one loading facility, the placard specified for that class in Table 2 must be applied. This paragraph does not apply to a portable tank, cargo tank, or tank car.

(c) When the gross weight of all hazardous materials covered by Table 2 is less than 1000 pounds, no placard is required on a motor vehicle, rail car, or freight container for the Table 2 materials. A Table 1 material must be placarded as specified in Table 1. This paragraph does not apply to portable tanks, cargo tanks, tank cars, transportation by air or water, or transport vehicles and freight containers subject to § 172.505.

(d) Any packaging having a capacity of 110 gallons or less that contains only the residue of a hazardous material covered by Table 2 of this section need not be included in determining the applicability of the placarding requirements.

TABLE 1

If the motor vehicle, rail car, or freight container contains a material classed (described) as—	The motor vehicle, rail car, or freight container must be placarded on each side and each end—
Class A explosives	EXPLOSIVES A.[1]
Class B explosives	EXPLOSIVES B.[2]
Poison A	POISON GAS.[1]
Flammable solid (DANGEROUS WHEN WET label only)	FLAMMABLE SOLID W.[3]
Radioactive material	RADIOACTIVE.[4, 5]
Radioactive material:	
Uranium hexafluoride, fissile (containing more than 1.0 pct U^{235})	RADIOACTIVE [4] AND CORROSIVE.[6]
Uranium hexafluoride, low specific activity (containing 1.0 pct or less U^{235})	RADIOACTIVE [4, 5] AND CORROSIVE.[6]

[1] See § 172.510(a).

[2] EXPLOSIVES B placard not required if the freight container, motor vehicle, or rail car contains class A explosives and is placarded EXPLOSIVES A as required.

[3] FLAMMABLE SOLID "W" placard is required only when the DANGEROUS WHEN WET label is specified in § 172.101 for a material classed as a Flammable solid.

[4] Applies only to any quantity of packages bearing the RADIOACTIVE YELLOW III label. (See § 172.403.)

[5] See § 173.403, for full-load shipments of radioactive materials meeting the definition of low specific activity when transported pursuant to § 173.425(b).

[6] CORROSIVE placard not required for shipments of less than 1000 pounds gross weight.

TABLE 2

If the motor vehicle, rail car or freight container contains a material classed (described) as—	The motor vehicle, rail car, or freight container must be placarded on each side and each end—
Class C explosives	DANGEROUS.[1, 9]
Blasting agents	BLASTING AGENTS.[8, 10]
Nonflammable gas	NONFLAMMABLE GAS.[8]
Nonflammable gas (chlorine)	CHLORINE.[7]
Nonflammable gas (fluorine)	POISON.
Nonflammable gas (oxygen, cryogenic liquid)	OXYGEN.
Flammable gas	FLAMMABLE GAS.[8]
Combustible liquid	COMBUSTIBLE.[3, 4]
Flammable liquid	FLAMMABLE.
Flammable solid	FLAMMABLE SOLID.[5]
Oxidizer	OXIDIZER.[8, 10]
Organic peroxide	ORGANIC PEROXIDE.
Poison B	POISON.
Corrosive material	CORROSIVE.[6]
Irritating material	DANGEROUS.

[1] Applies only to a class C explosive required to be labeled with an EXPLOSIVE C label.

[2] [Reserved]

[3] COMBUSTIBLE placard required only when a material classed as a combustible liquid is transported in a packaging having a rated capacity of more than 110 gallons, a cargo tank, or a tank car.

[4] A FLAMMABLE placard may be used on a cargo tank or portable tank during transportation by highway, rail or water, and on a compartmented tank car containing materials classed as Flammable liquid and Combustible liquid. However, no EMPTY placard may be displayed on an "empty" Combustible liquid tank car.

[5] Except when offered for transportation by water, a FLAMMABLE placard may be displayed in place of a FLAMMABLE SOLID placard except when a DANGEROUS WHEN WET label is specified for the material in sec. 172.101. (See table 1. this section.)

[6] See § 173.245(b) of this subchapter for authorized exceptions.

[7] CHLORINE placard required only for a packaging having a rated capacity of more than 110 gallons; the NON-FLAMMABLE GAS placard for packagings having a rated capacity of 110 gallons or less.

[8] A NON-FLAMMABLE GAS placard is not required on a motor vehicle displaying a FLAMMABLE GAS placard.

[9] BLASTING AGENTS, OXIDIZER and DANGEROUS placards need not be displayed if a freight container, motor vehicle, or rail car also contains Class A or Class B explosives and is placarded EXPLOSIVES A or EXPLOSIVES B as required.

[10] Except for shipments by water, OXIDIZER placards need not be displayed if a freight container, motor vehicle or rail car also contains blasting agents and is placarded BLASTING AGENT as required.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 172-29, 41 FR 15996, Apr. 15, 1976, as amended by Amdt. 172-29A, 41 FR 40679, Sept. 20, 1976; Amdt. 172-29B, 41 FR 57067, Dec. 30, 1976; Amdt. 172-48, 44 FR 31182, May 31, 1979; Amdt. 172-58, 45 FR 34701, May 22, 1980; 45 FR 46421, July 10, 1980; Amdt. 172-78, 48 FR 10226, Mar. 10, 1983; Amdt. 172-82, 48 FR 27692, June 16, 1983; Amdt. 172-81, 48 FR 28099, June 20, 1983; Amdt. 172-78, 48 FR 31217, July 7, 1983; Amdt. 172-82, 48 FR 50440, Nov. 1, 1983; Amdt. 172-96, 50 FR 11051, Mar. 19, 1985; Amdt. 172-98, 50 FR 39007, Sept. 26, 1985; Amdt. 172-99, 50 FR 41096, Oct. 8, 1985]

EFFECTIVE DATE NOTES: 1. Section 172.504 was amended at 50 FR 39007, Sept. 26, 1985, by revising footnote 4 of Table 2, effective October 1, 1986. The text of footnote 4 effective October 1, 1986, is set forth below.

§ 172.504 General placarding requirements.

* * * * *

TABLE 2

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[4] A FLAMMABLE placard may be used on a cargo tank, a portable tank and a compartmented tank car during transportation by highway, rail or water, if they contain materials classed as Flammable liquid or Combustible liquid. However, no RESIDUE placard may be displayed on a tank car which only contains residue of a Combustible liquid.

* * * * *

2. Section 172.504 was further amended at 50 FR 41096, Oct. 8, 1985, by revising the last sentence of paragraph (c), effective January 1, 1986. For the convenience of the user, the superseded text is set forth below.

§ 172.504 General placarding requirements.

* * * * *

(c) * * *. This paragraph does not apply to a portable tank, cargo tank, tank car, or to transportation by aircraft or vessel.

* * * * *

§ 172.505 Special placarding requirements for certain poisonous materials.

Each transport vehicle and freight container that contains a material subject to the "Poison-Inhalation Hazard" shipping paper description of § 172.203(k)(4) must be placarded POISON on each side and each end in addition to the placards required by § 172.504. This requirement also applies to portable tanks. Duplication of POISON placards is not required nor display of UN class numbers at the bottom of additional placards required by this section.

[50 41096, Oct. 8, 1985]

EFFECTIVE DATE NOTE: Section 172.505 was added at 50 FR 41096, Oct. 8, 1985, effective January 1, 1986.

§ 172.506 Providing and affixing placards: Highway.

(a) Each person offering a motor carrier a hazardous material for transportation by highway shall provide to the motor carrier the required placards for the material being offered prior to or at the same time the material is offered for transportation, unless the carrier's motor vehicle is already placarded for the material as required by this subpart.

(1) No motor carrier may transport a hazardous material in a motor vehicle, unless the placards required for the hazardous material are affixed thereto as required by this subpart.

[Amdt. 172-29, 41 FR 15996, Apr. 15, 1976, as amended by Amdt. 172-29A, 41 FR 40679, Sept. 20, 1976]

§ 172.507 Special placarding provisions: Highway.

Each motor vehicle used to transport a package of highway route controlled quantity radioactive materials (see § 173.403(l) of this subchapter) must have the required RADIOACTIVE warning placard placed on a square background as described in § 172.527.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 172-78, 48 FR 10226, Mar. 10, 1983]

§ 172.508 Placarding and affixing placards: Rail.

(a) Each person offering a hazardous material for transportation by rail shall affix to the rail car containing the material, the placards specified by this subpart for the material unless the placards already displayed on motor vehicles, transport containers, or portable tanks that are on a rail car comply with §§ 172.502 and 172.504 as these sections pertain to placarding the rail car.

(b) No rail carrier may accept a rail car containing a hazardous material for transportation unless the placards for the hazardous material are affixed thereto as required by this subpart.

[Amdt. 172-29, 41 FR 15996, Apr. 15, 1976, as amended by Amdt. 172-29B, 41 FR 57068, Dec. 30, 1976]

§ 172.510 Special placarding provisions: Rail.

(a) *Square background required.* Each Explosive A placard, Poison Gas placard and POISON GAS—EMPTY, placard affixed to a rail car must be placed on a square background as described in § 172.527.

(b) *DOME placard.* Each domed tank car containing a flammable liquid having a vapor pressure exceeding 16 p.s.i. at 100° F. (37.8° C.) must have a DOME placard affixed thereto as specified in § 173.119(h) of this subchapter.

(c) *EMPTY placard.* Each empty tank car must be placarded with an EMPTY placard as required and described in § 172.525 or paragraph (a) of this section, as appropriate, that corresponds to the placard that was required for the material the tank car last contained unless the tank car last contained a Combustible liquid or has been:

(1) Reloaded with a material not subject to this subchapter; or

(2) Sufficiently cleaned of residue and purged of vapor to remove any potential hazard.

(d) *FUMIGATION placard.* Each freight container, motor vehicle, and rail car containing lading that has been fumigated or treated with poisonous liquid, solid, or gas, and that is offered for transportation by rail must have the placard specified in § 173.9 of this subchapter affixed on or near each door.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 172-29, 41 FR 15996, Apr. 15, 1976, as amended by Amdt. 172-29A, 41 FR 40680, Sept. 20, 1976; Amdt. 172-78, 48 FR 10226, Mar. 10, 1983; Amdt. 172-98, 50 FR 39007, Sept. 26, 1985]

EFFECTIVE DATE NOTE: Section 172.510 was amended at 50 FR 39007, Sept. 26, 1985, by revising paragraphs (a) and (c), effective October 1, 1986. The text of paragraphs (a) and (c) effective October 1, 1986, is set forth below.

§ 172.510 Special placarding provisions: Rail.

(a) *Square background required.* Each EXPLOSIVE A placard, POISON GAS placard and POISON GAS-RESIDUE placard affixed to a rail car must be placed on a square background as described in § 172.527.

* * * * *

(c) *RESIDUE placard.* Each tank car containing the residue of a hazardous material must be placarded with the appropriate RESIDUE placards, as required in § 172.525 and paragraph (a) of this section. The RESIDUE placard must correspond to the placard that was required for the material the tank car contained when loaded, unless the tank car—

(1) Contains the residue of a combustible liquid;

(2) Is reloaded with a material requiring no placards or different placards; or

(3) Is sufficiently cleaned of residue and purged of vapor to remove any potential hazard.

* * * * *

§ 172.512 Freight containers and aircraft unit load devices.

(a) *Capacity of 640 cubic feet or more.* Each person who offers for transportation, and each person who loads and transports, a hazardous material in a freight container or aircraft unit load device having a capacity of 640 cubic feet or more shall affix to the freight container or aircraft unit load device the placards specified for the material in accordance with § 172.504. However:

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(1) The placarding exception provided in § 172.504(c)(1) applies to motor vehicles transporting freight containers and aircraft unit load devices,

(2) The placarding exception provided by paragraphs (c)(1) and (c)(2) of § 172.504 applies to each freight container and aircraft unit load device being transported for delivery to a consignee immediately following air or water shipment, and,

(3) Placarding is not required on a freight container or aircraft unit load device if it is only transported by air and is identified as containing a hazardous material in the manner provided in Part 5, Chapter 2, Section 2.7, of the ICAO Technical Instructions.

(b) *Capacity less than 640 cubic feet.* Each person who offers for transportation by air, and each person who loads and transports by air, a hazardous material in a freight container or aircraft unit load device having a capacity of less than 640 cubic feet shall affix one placard of the type specified by paragraph (a) of this section unless the freight container or aircraft unit load device:

(1) Is labeled in accordance with § 172.406(e)(3);

(2) Contains radioactive materials requiring the Radioactive Yellow III label and is placarded with one Radioactive placard and is labeled in accordance with § 172.406(e); or,

(3) Is identified as containing a hazardous material in the manner provided in Part 5, Chapter 2, Section 2.7, of the ICAO Technical Instructions.

When hazardous materials are offered for transportation, not involving air transportation, in a freight container having a capacity of less than 640 cubic feet the freight container need not be placarded. However, if not placarded it must be labeled in accordance with Subpart E of this part.

(c) Notwithstanding paragraphs (a) and (b) of this section, packages containing hazardous materials, other than ORM-D, offered for transportation by air in freight containers are subject to the inspection requirements of § 175.30 of this chapter.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 172-29, 41 FR 15996, Apr. 15, 1976, as amended by Amdt. 172-29A, 41 FR 40680, Sept. 20, 1976; Amdt. 172-29B, 41 FR 57068, Dec. 30, 1976; Amdt. 172-87, 48 FR 53712, Nov. 29, 1983; 48 FR 55469, Dec. 13, 1983]

§ 172.514 Cargo tanks and portable tanks.

(a) Each person who offers for transportation a cargo tank or a portable tank containing a hazardous material shall affix the placards specified for the material in accordance with § 172.504(a). However, if placarded instead of labeled as provided in § 172.406(e)(4), a portable tank having a rated capacity of less than 1,000 gallons need be placarded on only two opposite sides.

(b) Each cargo tank and portable tank that is required to be placarded when it contains a hazardous material must remain placarded when it is emptied unless it is:

(1) Reloaded with a material not subject to this subchapter; or

(2) Sufficiently cleaned and purged of vapors to remove any potential hazard.

[Amdt. 172-29, 41 FR 15996, Apr. 15, 1976, as amended by Amdt. 172-29A, 41 FR 40680, Sept. 20, 1976; Amdt. 172-29B, 41 FR 57068, Dec. 30, 1976]

§ 172.516 Visibility and display of placards.

(a) Each placard on a motor vehicle and each placard on a rail car must be readily visible from the direction it faces except from the direction of another motor vehicle or rail car to which the motor vehicle or rail car is coupled. This requirement may be met by the placards displayed on the freight containers or portable tanks loaded on a motor vehicle or rail car.

(b) The required placarding of the front of a motor vehicle may be on the front of a truck-tractor instead of or in addition to the placarding on the front of the cargo body to which a truck-tractor is attached.

(c) Each placard on a transport vehicle, portable tank or freight container must:

(1) Be securely attached or affixed thereto or placed in a holder thereon. (See Appendix C to this part.);

(2) Be located clear of appurtenances and devices such as ladders, pipes, doors, and tarpaulins;

(3) So far as practicable, be located so that dirt or water is not directed to it from the wheels of the transport vehicle;

(4) Be located away from any marking (such as advertising) that could substantially reduce its effectiveness, and in any case at least 3 inches (76.0 mm.) away from such marking;

(5) Have the words or identification number (when authorized) printed on it displayed horizontally, reading from left to right.

(6) Be maintained by the carrier in a condition so that the format, legibility, color, and visibility of the placard will not be substantially reduced due to damage, deterioration, or obscurement by dirt or other matter.

(d) Recommended specifications for a placard holder are set forth in Appendix C of this part. Except for a placard holder similar to that contained in Appendix C to this part, the means used to attach a placard may not obscure any part of its surface other than the borders.

(e) A placard or placard holder may be hinged provided the required format, color, and legibility of the placard are maintained.

[Amdt. 172-29, 41 FR 15996, Apr. 15, 1976, as amended by Amdt. 172-101, 45 FR 74668, Nov. 10, 1980]

§ 172.519 General specifications for placards.

(a) A placard may be made of any plastic, metal, or other material that is equal to or better in strength and durability than the tagboard specified in paragraph (b) of this section. Also, reflective or retroreflective materials may be used on a placard providing the prescribed colors, strength and durability are maintained.

(b) A placard made of tagboard must be of material that has:

(1) A quality at least equal to that designated commercially as white tagboard;

(2) A weight of 125 pounds per ream of 24 by 36-inch sheets;

(3) The ability to pass a 60 p.s.i. Mullen test; and

(4) The ability to withstand open weather exposure for 30 days without a substantial reduction in effectiveness.

(c) A placard may contain form identification information, including the name of its maker if that information is printed in the outer ½-inch (12.7 mm.) border in no larger than 10-point type.

(d) The hazard class and division number prescribed for dangerous goods in the UN Recommendations titled "Transport of Dangerous Goods" may be entered in the lower corner of the diamond on each placard. If a placard is used to display identification numbers as authorized by § 172.332, the class number must be entered in a numeral approximately 1¾ inches (45 mm.) in height (numeral height may be between 1⅝ inches (41 mm.) and 1¾ inches (45 mm.)). It must be black on each placard except when on a NON-FLAMMABLE GAS, FLAMMABLE GAS, FLAMMABLE, COMBUSTIBLE or CORROSIVE placard. The class number on a NON-FLAMMABLE GAS, FLAMMABLE GAS, FLAMMABLE and COMBUSTIBLE placard may be white or black. The class number on a CORROSIVE placard must be white, and on a COMBUSTIBLE placard with a white bottom as prescribed by § 172.332(c)(4), the class number must be red or black.

(e) Surface pigmentation on a placard must meet the following requirements:

(1) Black and any color must be able to withstand, without substantial change:

(i) A 72-hour fadeometer test (for a description of equipment designed for this purpose, see ASTM G 23-69 (1975), or ASTM G 26-70); and

(ii) A 30-day exposure to open weather conditions.

(2) A color on a placard, upon visual examination, must fall within the color tolerances displayed on the appropriate Office of Hazardous Materials Label and Placard Color Tolerance Chart (see § 172.407(d)).

(f) Except as provided in § 172.332, placards shall be as described in this section and as prescribed in Appendix B to this part.

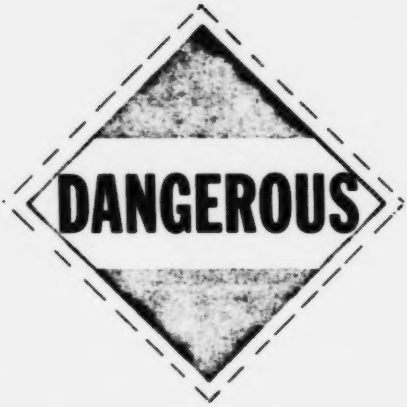
(g) The dotted line at the outside of the ½-inch (12.7 mm.) white border on each placard is not part of the placard specification. However, a dotted or solid line outer border may be used when needed to indicate the full size of a placard that is part of a larger format or is on a background the color of which does not contrast with the placard color.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53(e))

[Amdt. 172-29, 41 FR 15996, Apr. 15, 1976, as amended by Amdt. 172-29A, 41 FR 40680, Sept. 20, 1976; Admt. 172-37, 42 FR 34285, July 5, 1977; Amdt. 172-58, 45 FR 34702, May 22, 1980; Amdt. 172-58, 45 FR 74668, Nov. 10, 1980; Amdt. 172-85, 48 FR 50460, Nov. 1, 1983]

§ 172.521 DANGEROUS placard.

(a) Except for size and color, the DANGEROUS placard must be as follows:

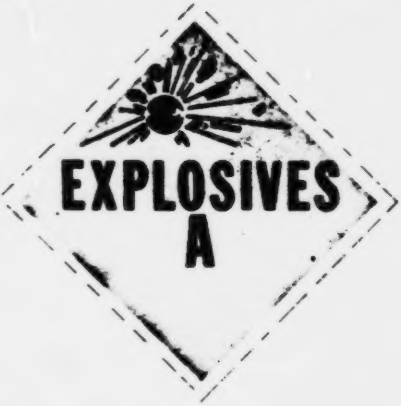


(b) In addition to meeting the requirements of § 172.519, and Appendix B to this part, the DANGEROUS placard must have a red upper and lower triangle. The placard center area and ½-inch (12.7 mm.) border must be white. The inscription must be black with the ⅛-inch (3.2 mm.) border marker in the white area at each end of the inscription red.

[Amdt. 172-29, 41 FR 15996, Apr. 15, 1976, as amended by Amdt. 172-29A, 41 FR 40680, Sept. 20, 1976]

§ 172.522 EXPLOSIVES A placard.

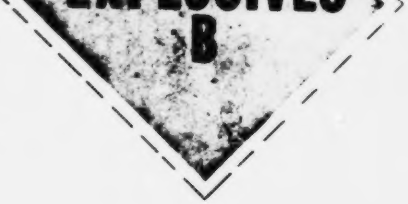
(a) Except for size and color, the EXPLOSIVES A placard must be as follows:



(b) In addition to meeting the requirements of § 172.519, and Appendix B to this part, the EXPLOSIVES A placard must be orange with a ½ inch (12.7 mm.) white outer border. The symbol and print must be black.

§ 172.523 EXPLOSIVES B placard.

(a) Except for size and color, the EXPLOSIVES B placard must be as follows:



(b) In addition to meeting the requirements of § 172.519 and Appendix B to this part, the EXPLOSIVES B placard must be orange with a ½-inch

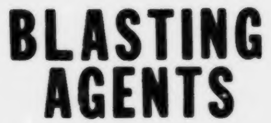
(12.7 mm.) white outer border. The symbol and print must be black.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt 172-29, 41 FR 15996, Apr. 15, 1976. Redesignated by Amdt. 172-48, 44 FR 31182, May 31, 1979]

§ 172.524 BLASTING AGENTS placard.

(a) Except for size and color, the BLASTING AGENTS placard must be as follows:



(b) In addition to meeting the requirements of this part, the BLASTING AGENTS placard must be orange with a ½-inch (12.7 mm) white outer border. The printing must be black.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 172-48, 44 FR 31182, May 31, 1979]

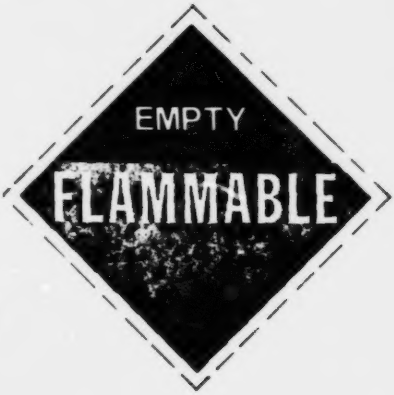
§ 172.525 Standard requirements for the EMPTY placard.

(a) Each EMPTY placard must be as follows:

(1) The triangle at the top of the placard must be black. The word "EMPTY" must be white.

(2) The midsection and lower triangle on the EMPTY placard must be as specified in § 172.519 and Appendix B to this part, and §§ 172.528, 172.530, 172.532, 172.536, 172.540, 172.542, 172.546, 172.548, 172.550, 172.552, 172.554, and 172.558 as appropriate for the residue of the commodity being transported and required by this subchapter to be placarded.

(b) The top part of each EMPTY placard must be as specified in Appendix B to this part and as illustrated on the FLAMMABLE—EMPTY placard, which, except for size and color, must be as follows:



(c) The EMPTY placard must be as shown in paragraph (b) of this section and may be:

(1) A separate placard,

(2) On the reverse side of a placard, or

(3) A composite made by covering the top triangle of the appropriate placard with a black triangle bearing the word "EMPTY" in white letters.

[Amdt. 172-29, 41 FR 15996, Apr. 15, 1976, as amended by Amdt. 172-29A, 41 FR 40680, Sept. 20, 1976]

EFFECTIVE DATE NOTE: Section 172.525 was revised at 50 FR 39007, Sept. 26, 1985, effective October 1, 1986. Section 172.525, effective October 1, 1986, is set forth below.

§ 172.525 Standard requirements for the RESIDUE placard.

(a) Each RESIDUE placard must be as follows:

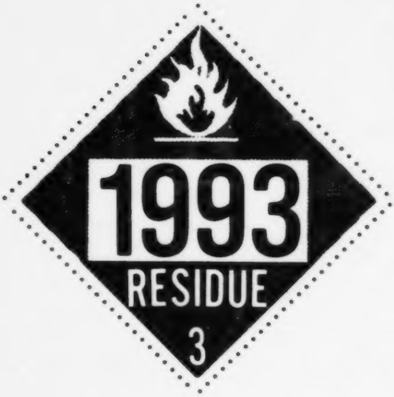
(1) The lower triangle of the RESIDUE placard must be black. The word "RESIDUE" must be in white letters approximately 1½ inches (40 mm) high made with approximately ¼ inch (6 mm) of an inch stroke.

(2) Except for the POISON GAS, RADIOACTIVE or EXPLOSIVES placard, the midsection of each RESIDUE placard must dis-

play the appropriate identification number as specified in § 172.332 (c) and (d).

Otherwise the RESIDUE placard must be specified in § 172.519 and Appendix B to this Part, and §§ 172.528, 172.530, 172.532, 172.536, 172.540, 172.542, 172.546, 172.548, 172.550, 172.552, 172.554, and 172.558, as appropriate for the residue of the hazardous material being transported and required by this subchapter to be placarded. No other placard may be used as a RESIDUE placard.

(b) The lower part of each placard must be specified in Appendix B to this Part and as illustrated on the FLAMMABLE-RESIDUE placard which, except for size and color, must be as follows:



(c) The RESIDUE placard must be as shown in paragraph (b) of this section and may be—

(1) A separate placard,

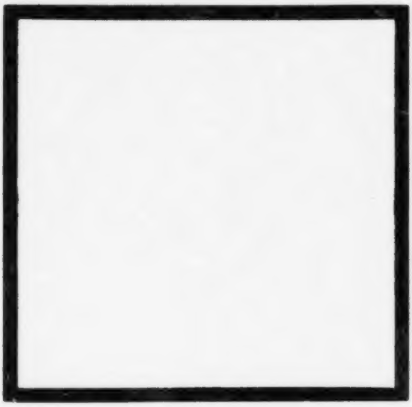
(2) On the reverse side of a placard, or

(3) A composite made according to the specifications in this section, and paragraph (a)(10) of Appendix B to this Part. The lower triangle of the appropriate placard should have a black triangle bearing the word RESIDUE in white letters with the appropriate hazard class number in white.

[Amdt. 172-98, 50 FR 39007, Sept. 26, 1985; 50 FR 46054, Nov. 6, 1985]

§ 172.527 Background requirements for certain placards.

(a) Except for size and color, the square background required by § 172.510(a) for certain placards on rail cars, and § 172.507 for placards on motor vehicles containing a package of highway route controlled quantity radioactive materials, must be as follows:



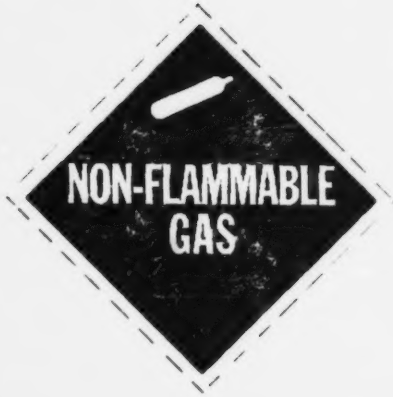
(b) In addition to meeting the requirements of § 172.519 for minimum durability and strength, the square background must consist of a white square measuring 14¼ inches (362.0 mm.) on each side surrounded by a black border extending to 15¼ inches (387.0 mm.) on each side.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 172-29, 41 FR 15996, Apr. 15, 1976, as amended by Amdt. 172-64, 46 FR 5316, Jan. 19, 1981; Amdt. 172-78, 48 FR 10226, Mar. 10, 1983]

§ 172.528 NON-FLAMMABLE GAS placard.

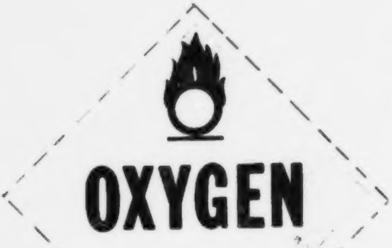
(a) Except for size and color, the NON-FLAMMABLE GAS placard must be as follows:



(b) In addition to meeting the requirement of § 172.519, and Appendix B to this part, the NON-FLAMMABLE GAS placard must be green with the symbol, inscription, and ½ inch (12.7 mm.) border white.

§ 172.530 OXYGEN placard.

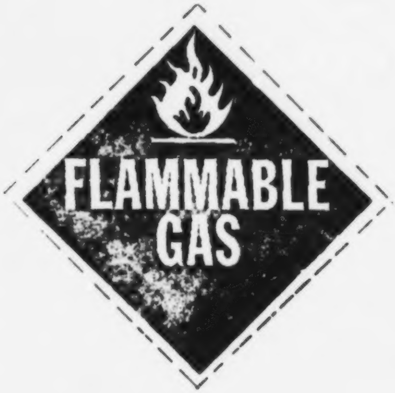
(a) Except for size and color, the OXYGEN placard must be as follows:



(b) In addition to meeting the requirements of § 172.519, and Appendix B to this part, the OXYGEN placard must be yellow with ½ inch (12.7 mm.) white border. The symbol and inscription must be black.

§ 172.532 FLAMMABLE GAS placard.

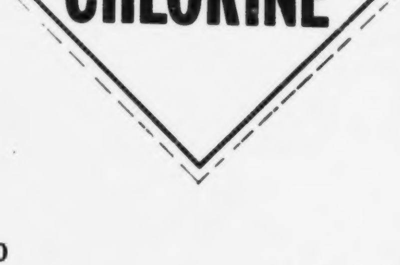
(a) Except for size and color, the FLAMMABLE GAS placard must be as follows:



(b) In addition to meeting the requirements of § 172.519, and Appendix B to this part, the FLAMMABLE GAS placard must be red with the symbol, inscription, and ½ inch (12.7 mm.) border white.

§ 172.536 CHLORINE placard.

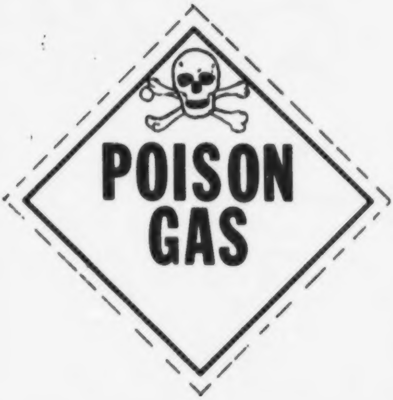
(a) Except for size, the CHLORINE placard must be as follows:



(b) In addition to meeting the requirements of § 172.519, and Appendix B to this part, the CHLORINE placard must be a white 10¾ inches (273.0 mm.) square-on-point with a ⅛-inch (3.2 mm.) black solid line border ½-inch (12.7 mm.) in from each edge. The symbol and inscription must be black.

§ 172.540 POISON GAS placard.

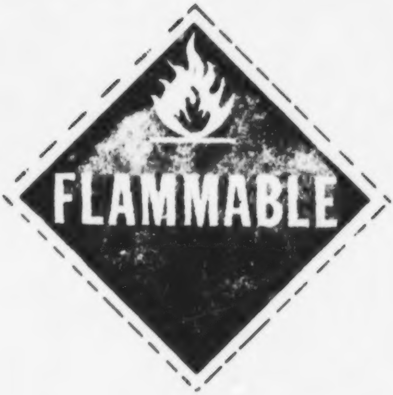
(a) Except for size, the POISON GAS placard must be as follows:



(b) In addition to meeting the requirements of § 172.519, and Appendix B to this part, the POISON GAS placard must be a white 10¾ inches (273.0 mm.) square-on-point with a ⅛-inch (3.2 mm.) black solid line border ½-inch (12.7 mm.) in from each edge. The symbol and inscription must be black.

§ 172.542 FLAMMABLE placard and modification.

(a) Except for size and color, the FLAMMABLE placard must be as follows:

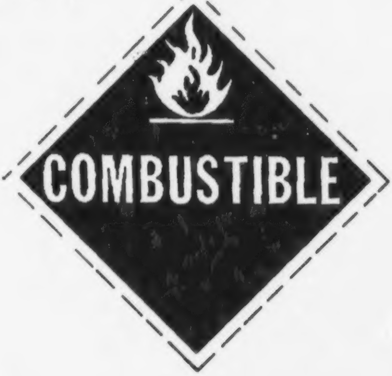


(b) In addition to meeting the requirements of § 172.519, and Appendix B to this part the FLAMMABLE placard must be red with white symbol, inscription, and ½-inch (12.7 mm.) border.

(c) The word "GASOLINE" may be used in place of the word "FLAMMABLE" on the placard that is displayed on a cargo tank or portable tank being used to transport gasoline by highway. The word "GASOLINE" must be in letters of the same size and color as those in the word "FLAMMABLE."

§ 172.544 COMBUSTIBLE placard and modification.

(a) Except for size and color, the COMBUSTIBLE placard must be as follows:

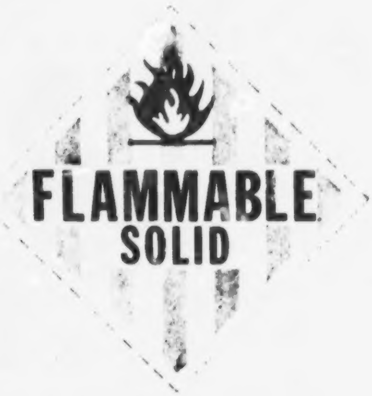


(b) In addition to meeting the requirements of § 172.519, and Appendix B to this part, the COMBUSTIBLE placard must be red with white symbol, inscription, and ½-inch (12.7 mm.) border.

(c) The words "FUEL OIL" may be used in place of the word "COMBUSTIBLE" on the placard that is displayed on a cargo tank or portable tank being used to transport by highway fuel oil that is not classed as a flammable liquid. The words "FUEL OIL" must be in letters of the same size and color as those in the word "COMBUSTIBLE."

§ 172.546 FLAMMABLE SOLID placard.

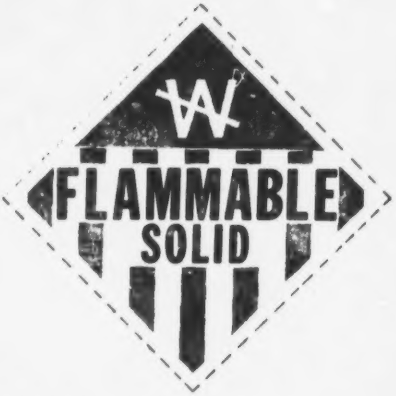
(a) Except for size and color, the FLAMMABLE SOLID placard must be as follows:



(b) In addition to complying with § 172.519 and Appendix B to this part the FLAMMABLE SOLID placard must be white with seven vertical red stripes and a ½-inch (12.7 mm.) white border. The symbol and inscription must be black.

§ 172.548 FLAMMABLE SOLID W placard.

(a) Except for size and color, the FLAMMABLE SOLID W placard must be as follows:



(b)(1) The triangle at the top of the FLAMMABLE SOLID W placard must be blue with a white symbol, otherwise, the specifications for the FLAMMABLE SOLID W placard are the same as those for the FLAMMABLE SOLID placard.

(2) The FLAMMABLE SOLID W placard may be:

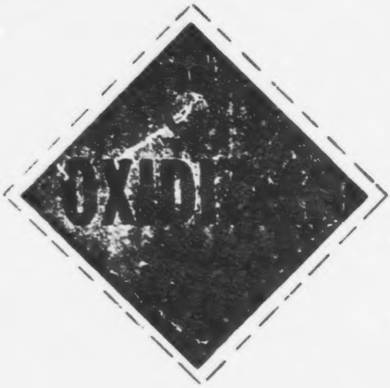
(i) A separate placard;

(ii) On the reverse side of a placard; or

(iii) A composite made by covering the top triangle of the FLAMMABLE SOLID placard with the blue triangle and white symbol as shown in paragraph (a) of this section.

§ 172.550 OXIDIZER placard.

(a) Except for size and color, the OXIDIZER placard must be as follows:



(b) In addition to meeting the requirements of § 172.519, and Appendix B to this part, the OXIDIZER placard must be yellow with a ½-inch (12.7 mm.) white border. The symbol and inscription must be black.

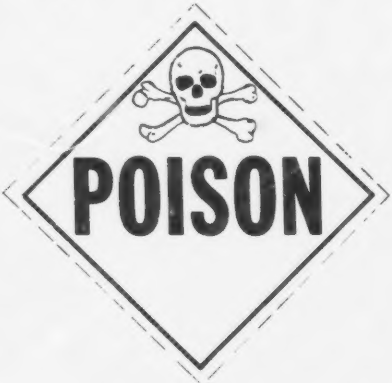
§ 172.552 ORGANIC PEROXIDE placard.

(a) Except for size and color, the ORGANIC PEROXIDE placard must be as follows:

(b) In addition to meeting the requirements of § 172.519, and Appendix B to this part the ORGANIC PEROXIDE placard must be yellow with a ½-inch (12.7 mm.) white border. The symbol and inscription must be black.

§ 172.554 POISON placard.

(a) Except for size, the POISON placard must be as follows:

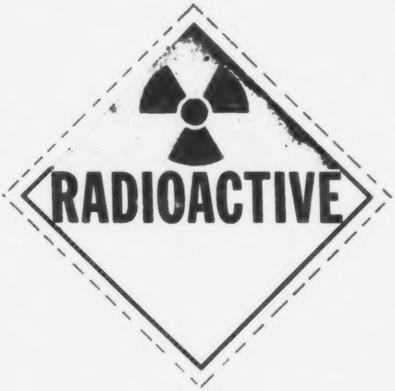


(b) In addition to meeting the requirements of § 172.519, and Appendix B to this part, the POISON placard must be white with a ⅛-inch (3.2 mm.) black solid line border ½-inch (12.7

mm.) in from the edge. The symbol and inscription must be black.

§ 172.556 RADIOACTIVE placard.

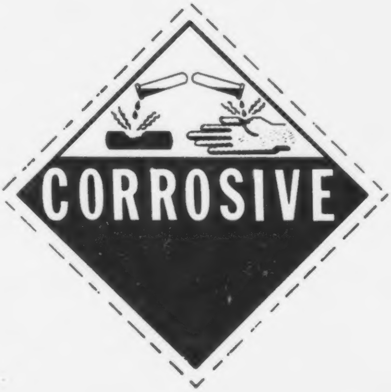
(a) Except for size and color, the RADIOACTIVE placard must be as follows:



(b) In addition to meeting the requirements of § 172.519, and Appendix B to this part, the RADIOACTIVE placard must have the top portion yellow with the symbol black. The lower portion must be white and the inscription black.

§ 172.558 CORROSIVE placard.

(a) Except for size, the CORROSIVE placard must be as follows:



(b) In addition to meeting the requirements of § 172.519, and Appendix B to this part, the CORROSIVE placard must have the center and lower area black except for the letters in the word "CORROSIVE" which must be white. The symbol must be black and white.

APPENDIX A—OFFICE OF HAZARDOUS MATERIALS TRANSPORTATION COLOR TOLERANCE CHARTS AND TABLES

The following are Munsell notations and Commission Internationale de L'Eclariage (CIE) coordinates which describe the Office of Hazardous Materials Transportation Label and Placard Color Tolerance Charts in Tables 1 and 2, and the CIE coordinates for the color tolerances specified in Table 3. Central colors and tolerances described in Table 2 approximate those described in Table 1 while allowing for differences in production methods and materials used to manufacture labels and placards surfaced with printing inks. Primarily, the color charts based on Table 1 are for label or placard colors applied as opaque coatings such as paint, enamel or plastic, whereas color charts based on Table 2 are intended for use with labels and placards surfaced only with inks.

For labels printed directly on packaging surfaces, Table 3 may be used, although compliance with either Table 1 or Table 2 is sufficient. However, if visual reference indicates that the colors of labels printed directly on package surfaces are outside the Table 1 or 2 tolerances, a spectrophotometer or other instrumentation may be required to insure compliance with Table 3.

TABLE 1—SPECIFICATIONS FOR COLOR TOLERANCE CHARTS FOR USE WITH LABELS AND PLACARDS SURFACED WITH PAINT, LACQUER, ENAMEL, PLASTIC, OTHER OPAQUE COATINGS, OR INK [1]

Color	Munsell notations	CIE data for source C		
		Y	x	y
Red:				
Central color	7.5R 4.0/14	12.00	.5959	3269
Orange	8.5R 4.0/14	12.00	.6037	3389
Purple and vivid	6.5R 4.0/14	12.00	.5869	.3184
Grayish	7.5R 4.0/12	12.00	.5603	.3321
Vivid	7.5R 4.0/16	12.00	.6260	.3192
Light	7.5R 4.5/14	15.57	.5775	.3320
Dark	7. 5R 3.5/14	09.00	.6226	.3141
Orange:				
Central color	5.OYR 6.0/15	30.05	.5510	.4214
Yellow and Grayish	6.25YR 6.0/15	30.05	.5452	.4329
Red and vivid	3.75YR 6.0/15	30.05	.5552	.4091
Grayish	5.OYR 6.0/13	30.05	.5311	.4154
Vivid	5.OYR 6.0/16	30.05	.5597	.4239
Light	5.OYR 6.5/15	36.20	.5427	.4206
Dark	5.OYR 5.5/15	24.58	.5606	.4218
Yellow:				
Central color.	5.OY 8.0/12	59.10	.4562	.4788
Green	6.5Y 8.0/12	59.10	.4498	.4865
Orange and vivid	3.5Y 8.0/12	59.10	.4632	.4669
Grayish	5.OY 8.0/10	59.10	.4376	.4601
Vivid	5.OY 8.0/14	59.10	.4699	.4920
Light	5.OY 8.5/12	68.40	.4508	.4754
Dark	5.OY 7.5/12	50.68	.4620	.4823
Green:				
Central color	7.5G 4.0/9	12.00	.2111	.4121
Bluish	0.5BG 4.0/9	12.00	.1974	.3809
Green-yellow	5.0G 4.0/9	12.00	2237	.4399
Grayish A	7.5G 4.0/7	12.00	.2350	.3922
Grayish B [2]	7.5G 4.0/6	12.00	.2467	.3822
Vivid	7.5G 4.0/11	12.00	.1848	.4319
Light	7.5G 4.5/9	15.57	.2204	.4060
Dark	7.5G 3.5/9	09.00	.2027	.4163
Blue:				
Central color	2.5PB 3.5/10	09.00	.1691	.1744
Purple	4.5PB 3.5/10	09.00	.1796	.1711
Green and vivid	10.0B 3.5/10	09.00	.1557	.1815
Grayish	2.5PB 3.5/8	09.00	.1888	.1964
Vivid	2.5PB 3.5/12	09.00	.1516	.1547
Light	2.5PB 4.0/10	12.00	.1805	.1888
Dark	2.5PB 3.0/10	06.55	.1576	.1600
Purple:				
Central color	10.0P 4.5/10	15.57	.3307	.2245
Reddish purple	2.5RP 4.5/10	15.57	.3584	.2377
Blue purple	7.5P 4.5/10	15.57	.3068	.2145
Reddish gray	10.0P 4.5/8	15.57	.3280	.2391
Gray [2]	10.0P 4.5/6.5	15.57	.3254	.2519
Vivid	10.0P 4.5/12	15.57	.3333	.2101
Light	10.0P 5.0/10	19.77	.3306	.2328
Dark	10.0P 4.0/10	12.00	.3306	.2162

[1] Maximum chroma is not limited.

[2] For the colors green and purple, the minimum saturation (chroma) limits for porcelain enamel on metal are lower than for most other surface coatings. Therefore, the minimum chroma limits of these two colors as displayed on the Charts for comparison to porcelain enamel on metal is low, as shown for green (grayish B) and purple (gray).

NOTE: CIE=Commission Internationale de L'Eclairage.

TABLE 2—SPECIFICATIONS FOR COLOR TOLERANCE CHARTS FOR USE WITH LABELS AND PLACARDS SURFACED WITH INK

Color/series	Munsell notation	CIE data for source C		
		Y	x	y
Red:				
Central series:				
Central color	6.8R 4.47/12.8	15.34	.5510	.3286
Grayish	7.2R 4.72/12.2	17.37	.5368	.3348
Purple	6.4R 4.49/12.7	15.52	.5442	.3258
Purple and vivid	6.1R 4.33/13.1	14.25	.5529	.3209
Vivid	6.7R 4.29/13.2	13.99	.5617	.3253
Orange	7.3R 4.47/12.8	15.34	.5572	.3331
Orange and grayish	7.65R 4.70/12.4	17.20	.5436	.3382
Light series:				
Light	7.0R 4.72/13.2	17.32	.5511	.3322
Light and orange	7.4R 4.96/12.6	19.38	.5365	.3382
Light and purple	6.6R 4.79/12.9	17.94	.5397	.3289
Dark series:				
Dark A	6.7R 4.19/12.5	13.30	.5566	.3265
Dark B	7.0R 4.25/12.35	13.72	.5522	.3294
Dark and purple	7.5R 4.23/12.4	13.58	.5577	.3329
Orange:				
Central series:				
Central color	5.0YR 6.10/12.15	31.27	.5193	.4117
Yellow and grayish A	5.8YR 6.22/11.7	32.69	.5114	.4155
Yellow and grayish B	6.1YR 6.26/11.85	33.20	.5109	.4190
Vivid	5.1YR 6.07/12.3	30.86	.5226	.4134
Red and vivid A	3.9YR 5.87/12.75	28.53	.5318	.4036
Red and vivid B	3.6YR 5.91/12.6	29.05	.5291	.4021
Grayish	4.9YR 6.10/11.9	31.22	.5170	.4069
Light series:				
Light and vivid A	5.8YR 6.78/12.7	39.94	.5120	.4177
Light and yellow	6.0YR 6.80/12.8	40.20	.5135	.4198
Light and vivid B	4.9YR 6.60/12.9	37.47	.5216	.4126
Dark series:				
Dark and yellow	5.8YR 5.98/11.0	29.87	.5052	.4132
Dark A	5.1YR 5.80/11.1	27.80	.5127	.4094
Dark B	5.0YR 5.80/11.0	27.67	.5109	.4068
Yellow:				
Central series:				
Central color	4.3Y 7.87/10.3	56.81	.4445	.4589
Vivid A	4.5Y 7.82/10.8	55.92	.4503	.4658
Vivid B	3.3Y 7.72/11.35	54.24	.4612	.4624
Vivid and orange	3.2Y 7.72/10.8	54.25	.4576	.4572
Grayish A	4.1Y 7.95/9.7	58.18	.4380	.4516
Grayish B	5.1Y 8.06/9.05	60.12	.4272	.4506
Green-yellow	5.2Y 7.97/9.9	58.53	.4356	.4605
Light series:				
Light	5.4Y 8.59/10.5	70.19	.4351	.4628
Light and green-yellow	5.4Y 8.56/11.2	69.59	.4414	.4692
Light and vivid	4.4Y 8.45/11.4	67.42	.4490	.4682
Dark series:				
Dark and green-yellow	4.4Y 7.57/9.7	51.82	.4423	.4562
Dark and orange A	3.4Y 7.39/10.4	48.86	.4584	.4590
Dark and orange B	3.5Y 7.41/10.0	49.20	.4517	.4544
Green:				
Central series:				
Central color	9.75G 4.26/7.75	13.80	.2214	.3791
Grayish	10G 4.46/7.5	15.25	.2263	.3742
Blue A	1.4BG 4.20/7.4	13.36	.2151	.3625
Blue B	1.0BG 4.09/7.75	12.60	.2109	.3685
Vivid	8.4G 4.09/8.05	12.59	.2183	.3954
Vivid green-yellow	7.0G 4.23/8.0	13.54	.2292	.4045
Green-yellow	7.85G 4.46/7.7	15.23	.2313	.3914
Light series:				
Light and vivid	9.5G 4.45/8.8	15.21	.2141	.3883
Light and blue	0.2BG 4.31/8.8	14.12	.2069	.3814
Light and green-yellow	8.3G 4.29/9.05	14.01	.2119	.4006
Dark series:				
Dark and green-yellow	7.1G 4.08/7.1	12.55	.2354	.3972
Dark and grayish	9.5G 4.11/6.9	12.70	.2282	.3764

TABLE 2—SPECIFICATIONS FOR COLOR TOLERANCE CHARTS FOR USE WITH LABELS AND PLACARDS SURFACED WITH INK—Continued

Color/series	Munsell notation	CIE data for source C		
		Y	x	y
Dark	8.5G 3.97/7.2	11.76	.2269	.3874
Blue:				
Central series:				
Central color	3.5PB 3.94/9.7	11.58	.1885	.1911
Green and grayish A	2.0PB 4.35/8.7	14.41	.1962	.2099
Green and grayish B	1.7PB 4.22/9.0	13.50	.1898	.2053
Vivid	2.9PB 3.81/9.7	10.78	.1814	.1852
Purple and vivid A	4.7PB 3.53/10.0	9.15	.1817	.1727
Purple and vivid B	5.0PB 3.71/9.9	10.20	.1888	.1798
Grayish	3.75PB 4.03/9.1	12.17	.1943	.1981
Light series:				
Light and green A	1.7PB 4.32/9.2	14.22	.1904	.2056
Light and green B	1.5PB 4.11/9.6	12.72	.1815	.1971
Light and vivid	3.2PB 3.95/10.05	11.70	.1831	.1868
Dark series:				
Dark and grayish	3.9PB 4.01/8.7	12.04	.1962	.1992
Dark and purple A	4.8PB 3.67/9.3	9.95	.1918	.1831
Dark and purple B	5.2PB 3.80/9.05	10.76	.1965	.1865
Purple:				
Central series:				
Central color	9.5P 4.71/11.3	17.25	.3274	.2165
Red	1.0RP 5.31/10.8	22.70	.3404	.2354
Red and vivid A	1.4RP 5.00/11.9	19.78	.3500	.2274
Red and vivid B	0.2RP 4.39/12.5	14.70	.3365	.2059
Vivid	8.0P 4.04/12.0	12.23	.3098	.1916
Blue	7.0P 4.39/10.8	14.71	.3007	.2037
Grayish	8.8P 5.00/10.3	19.73	.3191	.2251
Light series:				
Light and red A	0.85RP 5.56/11.1	25.18	.3387	.2356
Light and red B	1.1RP 5.27/12.3	22.27	.3460	.2276
Light and vivid	9.2P 4.94/11.95	19.24	.3247	.2183
Dark series:				
Dark and grayish	9.6P 4.70/10.9	17.19	.3283	.2204
Dark and vivid	8.4P 4.05/11.6	12.35	.3144	.1970
Dark and blue	7.5P 4.32/10.5	14.19	.3059	.2078

TABLE 3—SPECIFICATION FOR COLORS FOR USE WITH LABELS PRINTED ON PACKAGINGS SURFACES

CIE data for source C	Red	Orange	Yellow	Green	Blue	Purple
x	.424	.460	.417	.228	.200	.377
y	.308	.370	.392	.354	.175	.205
x	.571	.543	.490	.310	.255	.377
y	.306	.400	.442	.354	.250	.284
x	.424	.445	.390	.228	.177	.342
y	.350	.395	.430	.403	.194	.205
x	.571	.504	.440	.310	.230	.342
y	.350	.430	.492	.403	.267	.284
Y (high)	23.0	41.6	72.6	20.6	15.9	21.2
Y (low)	7.7	19.5	29.1	7.4	6.5	8.2

(49 U.S.C. 1803,1804,1808, 49 CFR 1.53)

[Amdt. 172-50, 44 FR 9757, Feb. 15, 1979; Amdt. 172-50, 44 FR 10984, Feb. 26, 1979, as amended by Amdt. 172-50, 44 FR 22467, Apr. 16, 1979; 50 FR 45731, Nov. 1, 1985]

APPENDIX B—DIMENSIONAL SPECIFICATION FOR PLACARDS

1. *Placard specifications.* (a) The print type on each placard must be Franklin Gothic Condensed.

(b) Each square-on-point placard must measure 10¾ inches (273.0 mm.) on each side, the outer, ½-inch (12.7 mm.) of which must be white.

NOTE: The measurements in these specifications may be rounded to the nearest $\frac{1}{32}$ of an inch and to the nearest whole millimeter.

(c) Specifications for each placard to augment those in paragraphs (1)(a) and (b) of this Appendix and those contained in Subpart F, Part 172 of this subchapter are as follows:

(1) *DANGEROUS placard.* The word "DANGEROUS" must be across the center of the placard and made with letters $2\frac{7}{32}$ inches (56.4 mm.) high with a ⅜-inch (9.5 mm.) stroke. The white section of the placard must be centered across the placard and 5 inches (127 mm.) wide. The two ends of the white area must have an ⅛-inch (3.2 mm.) red solid line border to indicate the outer ½-inch (12.7 mm.) white placard border. The placard color must be red, white, and black.

(2) *EXPLOSIVES A placard.* The word "EXPLOSIVES" must be across the center area of the placard and made with letters 1⅞ inches (47.6 mm.) high with a $\frac{5}{16}$-inch (7.9 mm.) stroke. The top of the letters in the words "EXPLOSIVES" must be 1½ inches (38.1 mm.) above the placard horizontal center line. The top of the letter "A" must be ½-inch (12.7 mm.) below the horizontal center line. The letter "A" must be approximately 2 inches (50.8 mm.) high. The base of the symbol must be $2\frac{1}{16}$ inches (52.4 mm.) above the placard horizontal center line, and must be 4½ inch (114.3 mm.) high when measured from a horizontal line touching the lowest extremity. The width of the symbol must be 7⅞ inches (200.0 mm.) when measured between two lines perpendicular to the base line and touching the widest extremities on each side. The radius of the bomb must be ¾-inch (19.1 mm.). The placard color must be orange, black, and white.

(3) Except for the letter "B", the EXPLOSIVES B placard specifications are the same as those for the EXPLOSIVES A placard. The location, height, and stroke for the letter "B" are the same as those prescribed for the letter "A".

(4) The word "NON-FLAMMABLE" must be across the center area with the word "GAS" centered beneath the word "NON-FLAMMABLE." The letters in both words must be $1\frac{9}{16}$ inches (39.6 mm.) high and made with a $\frac{9}{32}$-inch (7.1 mm.) stroke. The top of the letters in the words "NON-FLAMMABLE" must be 1⅜ inches (35.9 mm.) above the placard horizontal center line, and the top of the letters in the word "GAS" must be $\frac{9}{16}$-inch (14.3 mm.) below the placard horizontal center line. The base of the symbol must be 3⅛ inches (79.3 mm.) above the horizontal centerline with the top $4\frac{15}{16}$ inches (125.4 mm.) above the placard horizontal center line. The lower portion of the cylinder (symbol) must be $\frac{17}{32}$-inch (13.5 mm.) wide with the neck ¼-inch (6.3 mm.) wide. The symbol must be $3\frac{9}{16}$ inches (90.4 mm.) long. The placard color must be green and white.

(5) The word "OXYGEN" must be centered on the placard horizontal center line in letters 2½ inches (63.5 mm.) high and made with a $\frac{7}{16}$-inch (11.1 mm.) stroke. The base of the bar in the symbol must be $2\frac{1}{16}$ inches (52.4 mm.) above the placard horizontal center line. The overall height of the symbol must be $4\frac{5}{16}$ (109.5 mm.) with the bar measuring ⅛-inch (3.2 mm.) wide and, $3\frac{3}{16}$ inches (55.5 mm.) long.

The symbol must be 2⅜ inches (60.3 mm.) across the widest part.

The outer ½-inch (12.7 mm.) of the 10¾ inches (273.0 mm.) square on-point placard must be white. The placard color must be yellow, black, and white.

(6) *FLAMMABLE GAS placard.* The word "FLAMMABLE" must be across the placard center area with the word "GAS" centered beneath the word "FLAMMABLE". The letters in both words must be 2 inches (50.8 mm.) high and made with a ⅜-inch (9.5 mm.) stroke. The top of the letters in the word "FLAMMABLE" must be 1⅝ inches (41.3 mm.) above the placard horizontal center line and the top of the word "GAS" must be ⅝-inch (15.9 mm.) below the placard horizontal center line. The base of the symbol bar must be 2¼ inches (57.1 mm.) above the placard horizontal center line, and must be $4\frac{17}{32}$ inches (115.1 mm.) high and $3\frac{5}{16}$ inches (84.1 mm.) wide. The bar must be $\frac{5}{32}$-inch (4.0 mm.) wide and $3\frac{5}{16}$ inches (84.1 mm.) long. The outer ½ (12.7 mm.) of the 10¾ inches (273.0 mm.) square-on-point placard must be white. The placard color must be red and white.

(7) *CHLORINE placard.* The specifications for the CHLORINE placard are the same as those for the POISON GAS placard except for the word "CHLORINE" and the symbol. The word "CHLORINE" must be centered on the placard horizontal center line in letters 2½ inches (63.5 mm.) high and made with a $\frac{7}{16}$-inch (11.1 mm.) stroke. The lowest part of the symbol must be 1¾ inches (44.5 mm.) above the placard horizontal center line. The symbol must be $3\frac{11}{16}$ inches (93.6 mm.) high and 5⅛ inches (130.2 mm.) across the widest extremities.

(8) *POISON GAS placard.* The word "POISON" must be across the center area

of the placard with the word "GAS" centered beneath the word "POISON." The letters in both words must be $2\frac{3}{16}$ inches (55.5 mm.) high and made with a $\frac{13}{32}$-inch (10.3 mm.) stroke. The top of the letters in the word "POISON" must be 2¼ inches (57.1 mm.) above the horizontal center line. The lowest part of the symbol must be 2¾ inches (69.8 mm.) above the horizontal center line and must be 3¼ inches (82.5 mm.) high and $4\frac{5}{16}$ inches (109.5 mm.) across the widest extremeties. The ⅛-inch (3.2 mm.) black border must be ½-inch (12.7 mm.) in from the placard edge. The placard color must be black and white.

(9) *FLAMMABLE placard.* The word "FLAMMABLE" must be centered on the placard horizontal center line. The letters in the word "FLAMMABLE" must be 2 inches (50.8 mm.) high and made with an $\frac{11}{32}$-inch (8.7 mm.) stroke. The base of the symbol bar must be 2¼ inches (57.1 mm.) above the placard horizontal center line. The symbol must be $4\frac{9}{16}$ inches (115.9 mm.) high and $3\frac{5}{16}$ inches (84.1 mm.) wide. The bar must be ⅛-inch (3.2 mm.) wide and $3\frac{5}{16}$ inches (84.1 mm.) long. The outer ½-inch (12.7 mm.) of the 10¾ inches (273.0 mm.) square-on-point placard must be white.

(10) *EMPTY placard.* The specifications for the FLAMMABLE-EMPTY placard is representative of the requirements for the following EMPTY placards: NON-FLAMMABLE GAS; POISON GAS; CHLORINE; OXYGEN; FLAMMABLE GAS; FLAMMABLE; FLAMMABLE SOLID; FLAMMABLE SOLID W; OXIDIZER; ORGANIC PEROXIDE; POISON; and CORROSIVE. The specification for each EMPTY placard must be the same as those prescribed for each placard except for the top triangle in the placard.

The base of the black triangle must be ¼-inch (6.3 mm.) above the top of the letters in the placard name. The base of the letters in the word EMPTY must be 3¼ inches (82.5 mm.) above the placard horizontal center line.

The letters in the word "EMPTY" must be 1-inch (25.4 mm.) high and made with a $\frac{7}{32}$-inch (5.5 mm.) stroke.

The EMPTY placards may be made in any of the three ways cited in § 172.525(c), Subpart F of Part 172.

(11) *COMBUSTIBLE placard.* The specification for the COMBUSTIBLE placard are the same as those prescribed for the FLAMMABLE placard except the letters in the word "COMBUSTIBLE" must be 1⅞ inches (47.6 mm.) high and made with an $\frac{11}{32}$-inch (8.7 mm.) stroke.

(12) *FLAMMABLE SOLID placard.* The word "FLAMMABLE" must be across the center of the placard with the word "SOLID" centered beneath the word "FLAMMABLE." The letters in the word "FLAMMABLE" must be 2 inches (50.8 mm.) high and made with a ⅜-inch (9.5 mm.) stroke. The letters in the word "SOLID" must be 1½ inches (38.1 mm.) high and made with a ¼-inch (6.3 mm.) stroke. The top of the letters in the word "FLAMMABLE" must be $1\frac{3}{16}$ inches (30.1 mm.) above the placard horizontal center line, and the top of the word "SOLID" must be 1-inch (25.5 mm.) below the placard horizontal center line. The base of the symbol bar must be 2¼ inches (57.1 mm.) above the placard horizontal center line. The symbol must be $4\frac{9}{16}$ inches (115.9 mm.) high and $3\frac{5}{16}$ inches (84.1 mm.) wide. The outer ½-inch (12.7 mm.) of the 10¾ inches (273.0 mm.) square-on-point placard must be white. Each red and white stripe must be approximately 1 inch (25.4 mm.) wide. The placard must have seven red stripes and six white stripes. One red stripe must be approximately centered on the vertical center line of the placard. The placard color must be black, white, and red.

(13) *FLAMMABLE SOLID W placard.* The specifications for the FLAMMABLE SOLID W are the same as the specifications for the FLAMMABLE SOLID placard except for the top triangle. The base of the blue triangle must be 2 inches (50.8 mm.) above the placard horizontal center line with the base of the symbol 2⅜ inches (60.3 mm.) above the placard horizontal center line. The symbol must be 2¼ inches (57.1 mm.) high; 2¾ inches (69.8 mm.) across the top 1¾ inches (44.4 mm.) across the base, and made with a $\frac{5}{16}$-inch (7.9 mm.) stroke. The white stripe in the symbol must be $\frac{7}{32}$-inch (5.5 mm.) wide and 3½ inches (88.9 mm.) long. The white stripe must slant upward from right to left at an angle of approximately 21 degrees from the horizontal. This placard may be made in any of the three ways cited in § 172.548, Subpart F of Part 172.

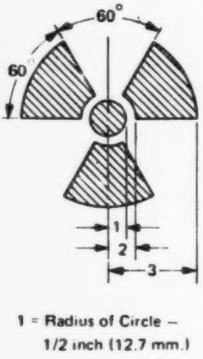
(14) *OXIDIZER placard.* The word "OXIDIZER" must be centered on the placard horizontal center line in letters 2½ inches (63.5 mm.) high with a $\frac{15}{32}$-inch (11.9 mm.) stroke. The base of the bar of the symbol must be $2\frac{1}{16}$ inches (52.4 mm.) above the placard horizontal center line. The overall height of the symbol must be $4\frac{5}{16}$ inches (109.5 mm.) with the bar measuring ⅛-inch (3.2 mm.) wide and $2\frac{3}{16}$ inches (55.6 mm.) long. The symbol must be 2⅜ inches (60.3 mm.) across the widest part. The outer ½-inch (12.7 mm.) of the 10¾ inches (273.0 mm.) placard must be white. The placard color must be yellow, black, and white.

(15) *ORGANIC PEROXIDE placard.* The word "ORGANIC" must be across the center line of the placard with the word "PEROXIDE" centered beneath the word "ORGANIC." The letters in both words must be 2 inches (50.8 mm.) high and made with an $\frac{11}{32}$-inch (8.7 mm.) stroke. The top of the letters in the word "ORGANIC"

must be 2⅛ inches (54.0 mm.) above the placard horizontal center line, and the top of the letters in the words "PEROXIDE" must be 5/16-inch (7.9 mm.) below the placard horizontal center line. The base of the symbol bar must be 2⅞ inches (73.0 mm.) above the horizontal center line. The symbol must be 3 11/16 inch (93.6 mm.) high and 2 1/16 inches (52.3 mm.) wide with the bar 3/16-inch (4.8 mm.) wide and 1⅞ inches (47.6 mm.) long. The outer ½-inch (12.7 mm.) of the 10¾ inches (273.0 mm.) square-on-point placard must be white. The placard color must be yellow, black, and white.

(16) *POISON placard.* The word "POISON" must be centered on the placard horizontal center line in letters 3 1/16 inches (77.8 mm.) high and made with a 9/16-inch (14.3 mm.) stroke. The lowest point on the symbol must be 2⅛ inches (54.0 mm.) above the placard horizontal center line. The symbol must be 3 11/16 inches (93.6 mm.) high and 4 15/16 inches (125.4 mm.) across the widest extremities. The ⅛-inch (3.2 mm.) black border must be ½-inch (12.7 mm.) in from the placard edge. The placard color must be black and white.

(17) *RADIOACTIVE placard.* The word "RADIOACTIVE" must be centered on the placard horizontal center line in letters 2 inches (50.8 mm.) with an 11/32-inch (8.7 mm.) stroke. The lower edge of the yellow triangle must be 1⅛ inches (28.6 mm.) above the placard horizontal center line. The lower edge of the symbol must be 1¼ inches (31.7 mm.) above the placard horizontal center line. The symbol must be made as shown with the following dimensions:



1 = Radius of Circle – 1/2 inch (12.7 mm.)

2 = 1 1/2 Radii

3 = 4 1/2 Radii

The lower white area must have a ⅛-inch (3.2 mm.) black solid line border extended from the edge of the yellow area to indicate the outer ½-inch (12.7 mm.) white placard border. The placard color must be yellow, black, and white.

(18) *CORROSIVE placard.* The word "CORROSIVE" must be across the center of the placard and made with letters 2 1/16 inches (52.4 mm.) high with a 11/32-inch (8.7 mm.) stroke. The base of the top white triangle must be 1½ inches (38.1 mm.) above the placard horizontal center line. The lowest part of the symbol must be 1⅝ inches (41.3 mm.) above the placard horizontal center line. The height of the symbol measured from a horizontal line extended from the lowest part of the symbol must be 3¼ inches (82.5 mm.) and the width across the widest part must be 7⅜ inches (187.3 mm.). The upper white area must have a ⅛-inch (3.2 mm.) black solid line border as an extension from the edge of the black area to indicate the outer ½-inch (12.7 mm.) white placard border. The placard color must be black and white.

(19) BLASTING AGENTS placard. The words BLASTING AGENTS must be across the center area of the placard and made with letters 1⅞ inches (47.6 mm) high with a 5/16-inch (7.9 mm) stroke.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 172-29, 41 FR 15996, Apr. 15, 1976]

EDITORIAL NOTE: For Federal Register citations to Appendix B of Part 172, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

EFFECTIVE DATE NOTE: Appendix B to Part 172 was amended at 50 FR 39008, Sept. 26, 1985, by revising paragraph (c)(10), effective October 1, 1986. The text of paragraph (c)(10) effective October 1, 1986, is set forth below. Paragraph (c)(10) was corrected at 50 FR 46054, Nov. 6, 1985.

APPENDIX B—DIMENSIONAL SPECIFICATIONS FOR PLACARDS

* * * * *

(c) * * *

(10) *RESIDUE placard.* The specifications for the FLAMMABLE-RESIDUE placard are the same as the specifications for the following RESIDUE placards: NON-FLAMMABLE GAS; POISON GAS; CHLORINE; OXYGEN; FLAMMABLE GAS; FLAMMABLE: FLAMMABLE SOLID; FLAMMABLE SOLID W; OXIDIZER, ORGANIC PEROXIDE; POISON; and CORROSIVE. The lower triangle of each RESIDUE placard must be black. This triangle must be 2-3/8 inches (50 mm) below the horizontal center line of the placard or adjacent to the lower edge of the white block for the identification number. The letters in the word RESI-

DUE must be approximately 1½ inches (40 mm) high, made with approximately ¼ inch (6 mm) stroke. The letters must be located in the lower black triangle and parallel to the horizontal center line of the placard. The hazard class number must be approximately 1½ inches (40 mm) high and centered below the word RESIDUE. The RESIDUE placard may be made in any of the three ways cited in § 172.525(c), Subpart F of Part 172.

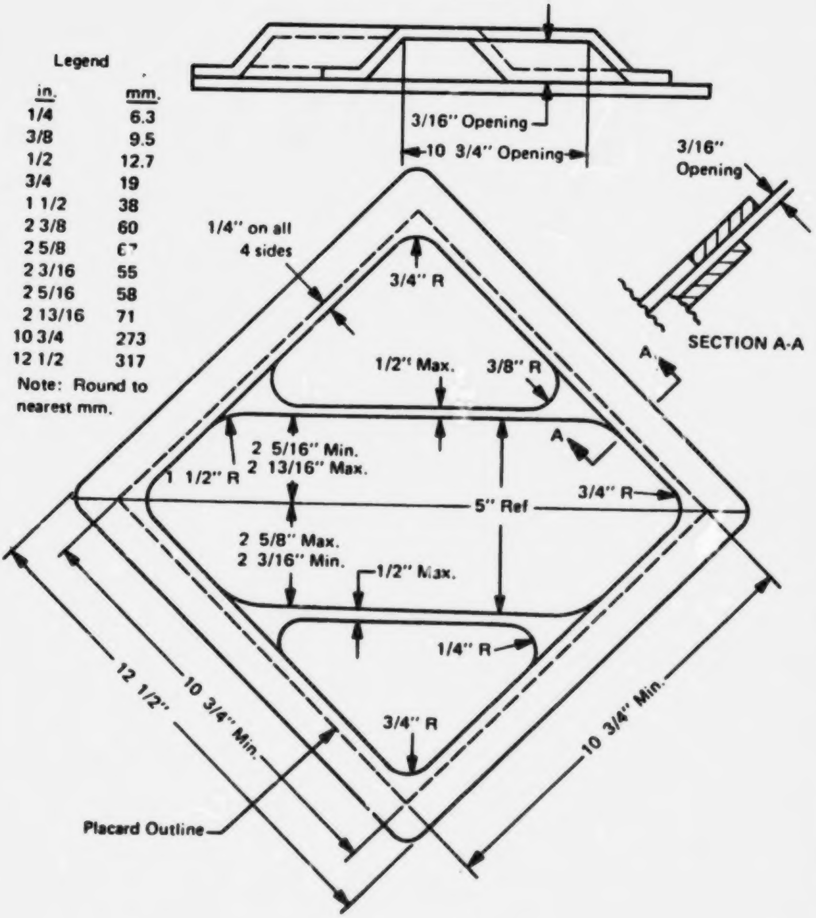
* * * * *

APPENDIX C—DIMENSIONAL SPECIFICATIONS FOR RECOMMENDED PLACARD HOLDER

Legend

in.	mm.
1/4	6.3
3/8	9.5
1/2	12.7
3/4	19
1 1/2	38
2 3/8	60
2 5/8	67
2 3/16	55
2 5/16	58
2 13/16	71
10 3/4	273
12 1/2	317

Note: Round to nearest mm.


3/16" Opening
10 3/4" Opening
3/16" Opening
SECTION A-A
A
A
1/4" on all 4 sides
3/4" R
1/2" Max.
3/8" R
2 5/16" Min.
2 13/16" Max.
1 1/2" R
3/4" R
5" Ref
2 5/8" Max.
2 3/16" Min.
1/2" Max.
1/4" R
3/4" R
12 1/2"
10 3/4" Min.
10 3/4" Min.
Placard Outline

PART 173—SHIPPERS—GENERAL REQUIREMENTS FOR SHIPMENTS AND PACKAGINGS

Subpart A—General

Sec.

173.1 Purpose and scope.
173.2 Classification of material having more than one hazard as defined in this part.
173.3 Packaging and exceptions.
173.3a Packaging; special requirements for certain poisonous materials.
173.4 Exceptions for small quantities.
173.5 Agricultural operations:
173.6 Shipments by air.
173.7 U.S. Government material.
173.9 Cars, truck bodies or trailers containing lading which has been fumigated or treated with flammable liquids, flammable gases, poisonous liquids or solids, or poisonous gases.
173.10 Tank car shipments.
173.11 Shipper's registration statement; flammable cryogenic liquids.
173.12 Exceptions for shipment of waste material.

Subpart B—Preparation of Hazardous Materials for Transportation

173.21 Forbidden materials and packages.
173.22 Shipper's responsibility.
173.22a Use of packagings authorized under exemptions.
173.23 Previously authorized packaging.
173.24 Standard requirements for all packages.
173.25 Authorized packages and overpacks.
173.26 Quantity limitations and metric measurements.
173.27 Aircraft quantity limitations.
173.28 Reuse of packagings (containers).
173.29 Empty packagings, portable tanks, cargo tanks, and tank cars.
173.30 Loading and unloading of transport vehicles.
173.31 Qualification, maintenance, and use of tank cars.
173.32 Qualification, maintenance and use of portable tanks other than Specification IM portable tanks.
173.32a Approval of Specification IM portable tanks.
173.32b Periodic testing and inspection of Specification IM portable tanks.
173.32c Use of Specification IM portable tanks.
173.32d Additions, modifications and removals of entries in the IM Tank Table.
173.33 Qualification, maintenance, and use of cargo tanks.

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173.34 Qualification, maintenance, and use of cylinders.

Subpart C—Explosives and Blasting Agents; Definitions and Preparation

173.50 An explosive.
173.51 Forbidden explosives.
173.52 Acceptable explosives.

CLASS A EXPLOSIVES; DEFINITIONS

173.53 Definition of Class A explosives.
173.54 Ammunition for cannon.
173.55 Ammunition, nonexplosive.
173.56 Ammunition, projectiles, grenades, bombs, mines, gas mines, and torpedoes.
173.57 Rocket ammunition.
173.58 Ammunition for small arms.
173.59 Chemical ammunition, explosive.
173.60 Black powder and low explosives.
173.61 High explosives.
173.62 High explosives, liquid.
173.63 High explosive with liquid explosive ingredient.
173.64 High explosives with no liquid explosive ingredient and propellant explosives, Class A.
173.65 High explosives with no liquid explosive ingredient nor any chlorate.
173.66 Detonators.
173.68 Detonating primers.
173.69 Detonating fuzes, Class A, with or without radioactive components, detonating fuze parts containing an explosive, boosters, bursters, or supplementary charges.
173.70 Diazodinitrophenol or lead mononitroresorcinate.
173.71 Fulminate of mercury.
173.72 Guanyl nitrosamino guanylidene hydrazine.
173.73 Lead azide.
173.74 Lead styphnate.
173.75 Nitro mannite.
173.76 Nitrosoguanidine.
173.77 Pentaerythrite tetranitrate.
173.78 Tetrazene.
173.79 Jet thrust units (jato), Class A explosives; rocket motors, Class A explosives; igniters, jet thrust (jato), Class A explosives; and igniters, rocket motor, Class A explosives.
173.80 Charged well casing jet perforating guns.
173.86 New explosives definitions; approval and notification.
173.87 Explosives in mixed packing.

CLASS B EXPLOSIVES; DEFINITIONS

173.88 Definition of Class B explosives.
173.89 Ammunition for cannon with empty projectiles, inert-loaded projectiles, solid projectiles, tear gas projectiles or without projectiles.

Sec.
173.90 Rocket ammunition with empty, inert-loaded, or solid projectiles.
173.91 Special fireworks.
173.92 Jet thrust units (jato), Class B explosives; rocket motors, Class B explosives; igniters, jet thrust (jato), Class B explosives; igniters, rocket motors, Class B explosives; and starter cartridges, jet engine, Class B explosives.
173.93 Propellant explosives (solid) for cannon, small arms, rockets, guided missiles, or other devices, and propellant explosives (liquid).
173.94 Explosive power devices, Class B.
173.95 Rocket engines (liquid), Class B explosives.

CLASS C EXPLOSIVES; DEFINITIONS

173.100 Definition of Class C explosives.
173.101 Small-arms ammunition.
173.101a Cartridges, practice ammunition.
173.102 Explosive cable cutters; explosive power devices, Class C; explosive release devices, or starter cartridges, jet engine, Class C explosives.
173.103 Detonators, Class C explosives, and detonating primers, Class C explosives.
173.104 Cord, detonating flexible; mild detonating fuse, metal clad or flexible; or flexible linear shaped charges, metal clad.
173.105 Percussion, tracer, combination, time fuzes and tracers.
173.106 Cartridge bags, empty, with black powder igniters, igniters, safety squibs, electric squibs, delay electric igniters, igniter fuse-metal clad, and fuse lighters or fuse igniters.
173.107 Primers, percussion caps, and grenades, empty, primed.
173.108 Common fireworks, signal flares, hand signal devices, smoke signals, smoke candles, smoke grenades, smoke pots, and Very signal cartridges.
173.109 Toy caps.
173.110 Charged well casing jet perforating guns, total explosive content in guns not exceeding 20 pounds per motor vehicle.
173.111 Cigarette loads, explosive auto alarms, toy propellant devices, toy smoke devices, trick matches, and trick noise makers, explosive.
173.112 Oil well cartridges.
173.113 Detonating fuzes, Class C explosives.
173.114 Actuating cartridges, explosive, fire extinguisher or valve.
173.114a Blasting agents

Subpart D—Flammable, Combustible, and Pyrophoric Liquids; Definitions and Preparation

173.115 Flammable, combustible, and pyrophoric liquids; definitions.
173.116 Outage.
Sec.
173.117 Closing and cushioning.
173.118 Limited quantities of flammable liquids.
173.118a Exceptions for combustible liquids.
173.119 Flammable liquids not specifically provided for.
173.120 Automobiles, motorcycles, tractors, or other self-propelled vehicles.
173.121 Carbon bisulfide (disulfide).
173.122 Acrolein, inhibited.
173.123 Ethyl chloride.
173.124 Ethylene oxide.
173.125 Alcohol, n.o.s. (flammable liquid).
173.126 Nickel carbonyl.
173.127 Nitrocellulose or collodion cotton, fibrous, or nitrostarch, wet; nitrocellulose flakes; colloided nitrocellulose, granular, flake, or block, and lacquer base or lacquer chips, wet.
173.128 Paint and paint related material (flammable liquids).
173.130 Refrigerating machines.
173.131 Road asphalt, or tar, liquid.
173.132 Adhesive; cement; container cement; linoleum cement; pyroxylin cement; rubber cement; tile cement; wallboard cement, and coating solution.
173.133 Spirits of nitroglycerin.
173.134 Pyroforic liquids, n.o.s.
173.135 Diethyl dichlorosilane, dimethyl dichlorosilane, ethyl dichlorosilane, ethyl trichlorosilane, methyl trichlorosilane, trimethyl chlorosilane, and vinyl trichlorosilane.
173.136 Methyl dichlorosilane and trichlorosilane.
173.137 Lithium aluminum hydride, ethereal.
173.138 Pentaborane.
173.139 Ethylene imine, inhibited, and propylene imine, inhibited.
173.140 Zirconium, metallic, solutions, or mixtures thereof, liquid.
173.141 Amyl mercaptan, butyl mercaptan, ethyl mercaptan, isopropyl mercaptan, propyl mercaptan, and aliphatic mercaptan mixtures.
173.143 Methylchloromethyl ether, anhydrous.
173.144 Ink (flammable liquid).
173.145 Dimethylhydrazine, unsymmetrical, and methylhydrazine.
173.146 Heaters for refrigerator cars, flammable liquid fuel type.
173.147 Methyl vinyl ketone, inhibited.
173.148 Monoethylamine.
173.149 Methyl magnesium bromide in ethyl ether in concentrations not over 40 percent.
173.149a Nitromethane.

Sec.

Subpart E—Flammable Solids, Oxidizers, and Organic Peroxides; Definitions and Preparation

173.150 Flammable solid; definition.
173.151 Oxidizer; definition.
173.151a Organic peroxide; definition.
173.152 Packing.
173.153 Limited quantities of flammable solids, oxidizers and organic peroxides.
173.154 Flammable solids, organic peroxide solids and oxidizers not specifically provided for.
173.154a Fusees.
173.156 Barium peroxide and calcium peroxide.
173.157 Benzoyl peroxide, chlorobenzoyl peroxide (para), cyclohexanone peroxide, dimethylhexane dihydroperoxide, lauroyl peroxide, or succinic acid peroxide, wet.
173.158 Benzoyl peroxide, dry; chlorobenzoyl peroxide (para) dry; cyclohexanone peroxide, dry; lauroyl peroxide, dry; or succinic acid peroxide, dry.
173.159 Burnt cotton.
173.160 Calcium chlorite and sodium chlorite.
173.161 Calcium phosphide.
173.162 Charcoal.
173.163 Chlorate of soda, chlorate of potash, and other chlorates.
173.164 Chromic acid or chromic acid mixture, dry.
173.165 Coal, ground bituminous, sea coal, coal facings.
173.166 Cobalt resinate, precipitated, calcium resinate, and calcium resinate fused.
173.168 Lithium amide, powdered.
173.171 Fish scrap or fish meal.
173.173 Aluminum dross or magnesium dross.
173.174 Iron sponge, spent oxide, spent iron mass, spent iron sponge.
173.175 Lacquer base, or lacquer chips, dry.
173.176 Safety matches.
173.176a Strike anywhere matches.
173.177 Motion-picture film and X-ray film.
173.178 Calcium carbide, calcium silicon powder, and magnesium granules, coated.
173.179 N-methyl-N'-nitro-N-nitrosoguanidine.
173.182 Nitrates.
173.183 Potassium nitrate mixed (fused) with sodium nitrite.
173.184 Nitrocellulose or collodion cotton, wet; or nitrocellulose, colloided, granular, or flake, wet, or nitrostarch, wet, or nitroguanidine, wet.
173.187 Potassium peroxide; potassium superoxide; sodium peroxide or sodium superoxide.
173.188 Phosphoric anhydride.

Sec.

173.189 Phosphorus, amorphous, red.
173.190 Phosphorus, white or yellow.
173.191 Phosphorus pentachloride.
173.192 Ammonium picrate, picric acid, trinitrobenzoic acid, and urea nitrate, wet.
173.193 Picric acid, trinitrobenzoic acid, or urea nitrate, wet.
173.194 Potassium permanganate.
173.195 Pyroxylin plastic scrap.
173.197 Pyroxylin plastics, in sheets, rolls, rods, or tubes.
173.197a Smokeless powder for small arms.
173.198 Sodium hydride.
173.202 Sodium metal liquid alloy, potassium metal liquid alloy, and sodium potassium liquid alloy.
173.203 Tetranitromethane.
173.204 Sodium hydrosulfite.
173.205 Sodium picramate, wet.
173.206 Sodium or potassium, metallic; sodium amide; sodium potassium alloys; sodium aluminum hydride; lithium metal; lithium silicon; lithium ferro silicon; lithium hydride; lithium borohydride; lithium aluminum hydride; lithium acetylide-ethylene diamine complex; aluminum hydride; cesium metal; rubidium metal; zirconium hydride, powdered.
173.207 Sulfide of sodium or sulfide of potassium, fused or concentrated, when ground.
173.208 Titanium metal powder, wet or dry.
173.212 Trinitrobenzene and trinitrotoluene, wet.
173.214 Hafnium metal or zirconium metal, wet, minimum 25 percent water by weight, mechanically produced, finer than 270 mesh particle size; hafnium metal or zirconium metal, dry, in an atmosphere of inert gas, mechanically produced, finer than 270 mesh particle size; hafnium metal or zirconium metal, wet, minimum 25 percent water by weight, chemically produced (See Note 1), finer than 20 mesh particle size; hafnium metal or zirconium metal, dry, in an atmosphere of inert gas, chemically produced (See Note 1), finer than 20 mesh particle size.
173.216 Zirconium picramate, wet.
173.217 Calcium hypochlorite, hydrated; calcium hypochlorite, mixture, dry; lithium hypochlorite mixture, dry; mono-(trichloro) tetra-(monopotassium dichloro)-penta-s-triazinetrione, dry; potassium dichloro-s-triazine-trione, dry; sodium dichloro-s-triazinetrione, dry; trichloro-s-triazinetrione, dry.
173.218 Isopropyl percarbonate, unstabilized.
173.219 Potassium perchlorate.

Sec.
173.220 Magnesium or zirconium scrap consisting of borings, clippings, shavings, sheets, turnings, or scalpings, and magnesium metallic (other than scrap), powder, pellets, turnings, or ribbon; magnesium aluminum powder.
173.221 Liquid organic peroxides, n.o.s., and liquid organic peroxide solutions, n.o.s.
173.222 Acetyl peroxide and acetyl benzoyl peroxide, solution.
173.223 Peracetic acid.
173.224 Cumene hydroperoxide, dicumyl peroxide, diisopropylbenzene hydroperoxide, paramenthane hydroperoxide, pinane hydroperoxide, and tertiary butylisopropyl benzene hydroperoxide.
173.225 Phosphorus trisulfide, phosphorus sesquisulfide, phosphorus heptasulfide, and phosphorus pentasulfide.
172.227 Urea peroxide.
173.228 Zinc ammonium nitrite.
173.229 Chlorate and borate mixtures or chlorate and magnesium chloride mixtures.
173.230 Sodium, metallic, dispersion in organic solvent.
173.231 Calcium, metallic, crystalline.
173.232 Aluminum, metallic powder.
173.234 Sodium nitrite and sodium nitrite mixtures.
173.235 Ammonium bichromate (ammonium dichromate).
173.236 Decaborane.
173.237 Chlorine dioxide hydrate, frozen; chloric acid.
173.238 [Reserved]
173.239 Barium azide—50 percent or more water wet.
173.239a Ammonium perchlorate.

Subpart F—Corrosive Materials: Definition and Preparation

173.240 Corrosive material; definition.
173.241 Outage.
173.242 Bottles containing corrosive liquids.
173.243 Closing and cushioning.
173.244 Limited quantities of corrosive materials.
173.245 Corrosive liquids not specifically provided for.
173.245a Corrosive liquids, n.o.s. shipped in bulk.
173.245b Corrosive solids not specifically provided for.
173.246 Antimony pentafluoride, bromide pentafluoride, iodine pentafluoride, bromine trifluoride, and chlorine trifluoride.
Sec.
173.247 Acetyl bromide; acetyl chloride; acetyl iodide; antimony pentachloride; benzoyl chloride; boron trifluoride-acetic acid complex; chromyl chloride; dichloroacetyl chloride; diphenylmethyl bromide solutions; pyrosulfuryl chloride; silicon chloride; sulfur chloride (mono and di); sulfuryl chloride; thionyl chloride; tin tetrachloride (anhydrous); titanium tetrachloride; trimethyl acetyl chloride.
173.247a Vanadiam tetrachloride and vanadium oxytrichloride.
173.248 Spent sulfuric acid, or spent mixed acid.
173.249 Alkaline corrosive liquids, n.o.s.; alkaline liquids, n.o.s.; alkaline corrosive battery fluid; potassium fluoride solution; potassium hydrogen fluoride solution; sodium aluminate, liquid; sodium hydroxide solution; potassium hydroxide solution.
173.249a Cleaning compound, liquid; coal tar dye, liquid; dye intermediate, liquid; mining reagent, liquid; and textile treating compound mixture, liquid.
173.250 Automobiles, other self-propelled vehicles, engines or other mechanical apparatus.
173.250a Benzene phosphorus dichloride and benzene phosphorus thiodichloride.
173.251 Boron trichloride and boron tribromide.
173.252 Bromine.
173.253 Chloroacetyl chloride.
173.254 Chlorosulfonic acid and mixtures of chlorosulfonic acid-sulfur trioxide.
173.255 Dimethyl sulfate.
173.256 Compounds, cleaning, liquid.
173.257 Electrolyte (acid) and alkaline corrosive battery fluid.
173.258 Electrolyte, acid, or alkaline corrosive battery fluid, packed with storage batteries.
173.259 Electrolyte, acid, or alkaline corrosive battery fluid, packed with battery charger, radio current supply device, or electronic equipment and actuating devices.
173.260 Electric storage batteries, wet.
173.261 Fire-extinguisher charges.
173.262 Hydrobromic acid.
173.263 Hydrochloric (muriatic) acid, hydrochloric (muriatic) acid mixtures; hydrochloric (muriatic) acid solution, inhibited; sodium chlorite solution (not exceeding 42 percent sodium chlorite); and cleaning compounds, liquids, containing hydrochloric (muriatic) acid.
173.264 Hydrofluoric acid; white acid.
173.265 Fluosilicic acid (hydrofluorosilicic acid) (hydrofluosilicic acid).
173.266 Hydrogen peroxide solution in water.

Sec.
173.267 Mixed acid (nitric and sulfuric acid) (nitrating acid).
173.268 Nitric acid.
173.269 Perchloric acid.
173.270 Phosphorus tribromide.
173.271 Methyl phosphonic dichloride, phosphorus oxybromide, phosphorus oxychloride, phosphorus trichloride, and thiophosphoryl chloride.
173.272 Sulfuric acid.
173.273 Sulfur trioxide.
173.274 Fluosulfonic acid.
173.275 Difluorophosphoric acid, anhydrous, monofluorophosphoric acid, anhydrous, hexafluorophosphoric acid, and mixtures thereof.
173.276 Anhydrous hydrazine and hydrazine solution.
173.277 Hypochlorite solutions.
173.278 Nitrohydrochloric acid.
173.279 Anisoyl chloride.
173.280 Trichlorosilanes.
173.281 Benzyl bromide (bromotoluene, alpha).
173.282 Isopropyl percarbonate, stabilized.
173.283 Fluoboric acid.
173.284 Tungsten hexafluoride.
173.286 Chemical kits.
173.287 Chromic acid solution.
173.288 Chloroformates.
173.289 Formic acid and formic acid solutions.
173.290 Mixtures of hydrofluoric and sulfuric acid.
173.291 Flame retardant compound, liquid.
173.292 Hexamethylene diamine solution.
173.293 Iodine monochloride.
173.294 Monochloroacetic acid, liquid or solution.
173.295 Benzyl chloride.
173.296 Di iso octyl acid phosphate.
173.297 Titanium sulfate solution containing not more than 45 percent sulfuric acid.
173.299 Etching acid liquid, n.o.s.
173.299a Tris-(1-aziridinyl) phosphine oxide.

Subpart G—Gases; Definition and Preparation

173.300 Definitions.
173.300a Approval of independent inspection agency.
173.300b Approval of non-domestic chemical analyses and tests.
173.300c Termination of approval.
173.301 General requirements for shipment of compressed gases in cylinders.
173.302 Charging of cylinders with non-liquefied compressed gases.
173.303 Charging of cylinders with compressed gas in solution (acetylene).
173.304 Charging of cylinders with liquefied compressed gas.
Sec.
173.305 Charging of cylinders with a mixture of compressed gas and other material.
173.306 Limited quantities of compressed gases.
173.307 Exceptions for compressed gases.
173.308 Cigarette lighter or other similar device charged with fuel.
173.314 Requirements for compressed gases in tank cars.
173.315 Compressed gases in cargo tanks and portable tanks.
173.316 Cryogenic liquids in cylinders.
173.318 Cryogenic liquids in cargo tanks.
173.319 Cryogenic liquids in tank cars.
173.320 Cryogenic liquids; exceptions.

Subpart H—Poisonous Materials, Etiologic Agents, and Radioactive Materials; Definitions and Preparation

173.325 Classes of poisonous materials.
173.326 Poison A.
173.327 General packaging requirements for Poison A materials.
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173.359 Hexaethyl tetraphosphate mixtures; methyl parathion mixtures; organic phosphorus compound mixtures; organic phosphate compound mixtures; parathion mixtures; tetraethyl dithio pyrophosphate mixtures; and tetraethyl pyrophosphate mixtures, liquid (includes solutions, emulsions, or emulsifiable liquids).
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173.510 General packaging requirements.

Subpart K—Other Regulated Material; ORM-A

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173.610 Camphene.
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173.645 Ferrosilicon.
173.650 Hexachloroethane.

Sec.
173.655 Naphthalene or naphthalin.

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173.800 Ammonium hydrogen sulfate, ammonium fluoride, barium oxide, chloroplatinic acid, copper chloride, ferric chloride, lead chloride, molybdenum pentachloride, potassium hydrogen sulfate, sodium aluminate, sodium hydrogen sulfate, and/or sodium hydrogen sulfite (each in solid form).
173.850 Lime, unslaked; quicklime; and calcium oxide.
173.860 Mercury, metallic.
173.861 Gallium metal, liquid.
173.862 Gallium metal, solid.

Subpart M—Other Regulated Material; ORM-C

173.906 Inflatable life-rafts, escape slides, and evacuation slides.
173.910 Ammonium sulfate nitrate.
173.915 Battery parts.
173.920 Bleaching powder.
173.945 Calcium cyanamide, not hydrated.
173.952 Castor beans and castor pomace.
173.955 Coconut meal pellets.
173.960 Copra.
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173.995 Fish scrap and fish meal.
173.1010 Lead dross or scrap containing 3 percent or more free acid.
173.1015 Lithium batteries, for disposal.
173.1020 Magnetized material.
173.1025 Ferrous metal borings, shavings, turnings, or cuttings (excluding stainless steel).
173.1040 Pesticide, water-reactive.
173.1045 Petroleum coke, uncalcined.
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173.1200 Consumer Commodity.
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173.1300 Hazardous waste, liquid or solid, n.o.s.; hazardous substance liquid or solid, n.o.s.

APPENDIX A—METHOD OF TESTING CORROSION TO SKIN

APPENDIX B—PROCEDURE FOR TESTING CHEMICAL COMPATIBILITY AND RATE OF PERMEATION IN POLYETHYLENE PACKAGING AND RECEPTACLES

AUTHORITY: 49 U.S.C. 1803, 1804, 1805, 1808; 49 CFR 1.53(e), unless otherwise noted.

EDITORIAL NOTE: Nomenclature changes to Part 173 appear at 43 FR 48643 Oct. 19, 1978 (Amdt. 173-121), at 47 FR 43066, Sept. 30, 1982 (Amdt. 173-158), and at 50 FR 45731, Nov. 1, 1985.

Subpart A—General

§ 173.1 Purpose and scope.

(a) This part includes:

(1) Definitions of hazardous materials for transportation purposes;

(2) Requirements to be observed in preparing hazardous materials for shipment by air, highway, rail, or water, or any combination thereof; and

(3) Inspection, testing, and retesting responsibilities for persons who retest, recondition, maintain, repair and rebuild containers used or intended for use in the transportation of hazardous materials.

(b) A shipment that is not prepared for shipment in accordance with this subchapter may not be offered for transportation by air, highway, rail, or water. It is the duty of each person who offers hazardous materials for transportation to instruct each of his officers, agents, and employees having any responsibility for preparing hazardous materials for shipment as to applicable regulations in this subchapter.

(c) When a person other than the person preparing a hazardous material for shipment performs a function required by this part, that person shall perform the function in accordance with this part.

(49 U.S.C. 1803, 1804, 1808, and 1809; 49 CFR 1.53, App. A to Part 1)

[Amdt. 173-94, 41 FR 16062, Apr. 15, 1976, as amended by Amdt. 173-100, 41 FR 40476, Sept. 20, 1976; Amdt. 173-161, 48 FR 2655, Jan. 20, 1983]

§ 173.2 Classification of a material having more than one hazard as defined in this part.

(a) *Classification of material having more than one hazard as defined in this part.* Except as provided in paragraph (b) of this section, a hazardous material, having more than one hazard as defined in this part, must be classed according to the following order of hazards:

(1) Radioactive material (except a limited quantity).

(2) Poison A.

(3) Flammable gas.

(4) Non-flammable gas.

(5) Flammable liquid.

(6) Oxidizer.

(7) Flammable solid.

(8) Corrosive material (liquid).

(9) Poison B.

(10) Corrosive material (solid).

(11) Irritating materials.

(12) Combustible liquid (in containers having capacities exceeding 110 gallons).

(13) ORM-B.

(14) ORM-A.

(15) Combustible liquid (in containers having capacities of 110 gallons or less.)

(16) ORM-E.

(b) *Exceptions.* Paragraph (a) of this section does not apply to—(1) A material specifically identified in § 172.101 of this subchapter;

(2) An explosive required to be classed and approved under § 173.86, or a blasting agent required to be classed and approved under § 173.114a.

(3) An etiologic agent identified in § 173.386 as those materials listed in 42 CFR 72.3; or

(4) An organic peroxide. (See § 172.101 and § 173.151a of this subchapter.)

(5) A limited quantity radioactive material that also meets the definition of another hazard class (see § 173.421-2).

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 173-94, 41 FR 16062, Apr. 15, 1976, as amended by Amdt. 173-94A, 41 FR 40680, Sept. 20, 1976; Amdt. 173-124, 44 FR 31182, May 31, 1979; Amdt. 173-137, 45 FR 34702, May 22, 1980; Amdt. 173-167, 48 FR 30136, June 30, 1983; Amdt. 173-192, 50 FR 41522, Oct. 11, 1985]

§ 173.3 Packaging and exceptions.

(a) The packaging of hazardous materials for transportation by air, highway, rail, or water must be as specified in this part. Methods of manufacture, packing, and storage of hazardous materials, that affect safety in transportation, must be open to inspection by a duly authorized representative of the initial carrier or a representative of the Department. Methods of manufacture and related functions necessary for completion of a DOT specification packaging must be open to inspection by a representative of the Department.

(b) The regulations setting forth packaging requirements for a specific material apply to all modes of transportation unless otherwise stated, or unless exceptions from packaging requirements are authorized. For example, the restriction in § 173.249(b) applicable to cargoaircraft only applies only to quantities in excess of those allowable under § 173.244. Quantities covered under § 173.244 may also be shipped by cargoaircraft only.

(c) Packages of hazardous materials that are damaged or found leaking and hazardous materials that have been spilled or leaked may be placed in a metal removable head salvage drum that is compatible with the lading and shipped for repackaging or disposal under the following conditions.

(1) The drum utilized may be either a DOT specification or a non-DOT specification drum as long as the drum has equal or greater structural integrity than a package that is authorized for the respective material in this subchapter. Maximum capacity shall not exceed 110 gallons.

(2) Each drum must be provided with adequate closure and, when necessary, provided with sufficient cushioning and absorption material to prevent excessive movement of the damaged package and to absorb all free liquid. All cushioning and absorbent material used in the drum must be compatible with the hazardous material.

(3) Each drum must be marked with the proper shipping name of the material inside the defective packaging and the name and address of the consignee. In addition, the drum must be marked "Salvage Drum".

(4) Each drum must be labeled as prescribed for the respective material.

(5) The shipper shall prepare shipping papers in accordance with Subpart C of Part 172 of this subchapter.

(6) The overpack requirements of § 173.25, and the reuse provisions of §§ 173.28(h) and 173.28(m) do not apply to drums used in accordance with this paragraph.

[Amdt. 173-94, 41 FR 16062, Apr. 15, 1976, as amended by Amdt. 173-94A, 41 FR 40680, Sept. 20, 1976; Amdt. 173-116, 43 FR 17944, Apr. 27, 1978; Amdt. 173-133, 45 FR 5738, Jan. 24, 1980; Amdt. 173-16, 48 FR 50461, Nov. 1, 1983]

§ 173.3a Packaging; special requirements for certain poisonous materials.

(a) Nothwithstanding the packaging requirements and authorizations referred to in paragraph (b)(1) of this section (including exemptions referring thereto), no person may offer for transportation a material addressed by those sections that also meets the criteria of paragraph (b)(2) of this section except in a packaging:

(1) Specified in Subpart H of this part for any Poison A material if the packaging is made of materials that are chemically compatible with the hazardous materials;

(2) The basic containment unit of which has a rated capacity of one liter or less and that is otherwise offered for transportation in conformance with this Chapter; or

(3) Approved by the Associate Director for HMR based on a determination that the packaging provides a level of safety equivalent to a packaging authorized in this Chapter for Poison A materials, or to packagings authorized for a hazardous material having similar hazards addressed by a specific packaging regulation of this part.

(b) This section applies to any liquid material other than a liquefied compressed gas:

(1) Addressed by the Table in § 172.101 (Column 5b) of this subchapter to a packaging requirement prescribed in §§ 173.119, 173.125, 173.134, 173.154, 173.221, 173.254, 173.249, 173.346, or 173.352, or which is addressed by an exemption, issued under Subpart B of Part 107 of this chapter, that refers to one or more of those sections for the purpose of packaging authorization; and

(2) Having a saturated vapor concentration at 20°C(68°F) equal to or greater than ten times its LC_{50} (vapor) value if the LC_{50} value is 1000 parts per million (ppm) or less.

(c) For the purposes of this section:

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(1) LC_{50} means the concentration of vapor that, when administered by continuous inhalation of both male and female young albino rats for one hour, is most likely to cause death within 14 days to one half of the animals tested. The result is expressed in milliliters per cubic meter of air (ppm). Wherever practicable, the test should be conducted in accordance with the procedure described in the Organization for Economic Cooperation and Development (OECD) for Acute Inhalation Toxicity except that the periods of exposure shall be one hour instead of four hours.

(2) Saturated vapor concentration (SVC) means the concentration of vapor at equilibrium with the liquid phase at 20°C(68°F) and standard atmospheric pressure expressed in milliliters per cubic meter (expressed in ppm). This concentration may be calculated from the vapor pressure (VP) of the liquid at 20°C(68°F). The general formula is the vapor pressure divided by the standard atmospheric pressure and multiplied by a million. If the vapor pressure is expressed in millimeters (mm) of mercury the calculation would be

$$\frac{VP(\text{in mm Hg}) \times 10^6}{760} = SVC\ (\text{in ppm})$$

(3) If LC_{50} data are available based on other than a one hour exposure, a factor may be used to determine an acceptable one hour value for the purposes of this section. If the only value available is for a 4 hour exposure, that value is multiplied by 2. This method of estimating a LC_{50} value may not be used when a material causes death by direct pulmonary effect, i.e., by destruction of lung tissue as opposed to systemic poisoning. For these corrosive poisons, the exposure period must be one hour.

(4) LC_{50} data published in scientific and technical handbooks, journals and texts may be used in place of new tests using animals to determine compliance with this section. Where different values for the LC_{50} of a material are found, the most credible value must be used. The Registry of Toxic Effects of Chemical Substances (RTECS) published by NIOSH is a recommended source of these data.

(5) *Limit test.* As an alternative to determine a LC_{50} value, the following procedure may be used to determine whether a material is subject to this section: The saturated vapor concentration at 20°C(68°F) is determined as in paragraph (c)(2) of this section. This then is divided by 10 and the resulting concentration used to test 10 animals in accordance with the OECD procedure noted in paragraph (c)(1) of this section, with a one hour exposure period. If 5 or more animals die during the 14 day observation period, the material is subject to this section. For example: If a liquid has a saturated vapor concentration of 500 ppm at 20°C. the concentration used in the test outlined in this paragraph would be 50 ppm.

(d) The requirements of this section, and other requirements of this subchapter referring to this section for application, are effective as follows:

(1) Transportation in packagings having capacities greater than 110 gallons after April 30, 1986.

(2) Transportation in packaging having capacities of 110 gallons or less after September 30, 1986.

(3) Until January 1, 1988, LC_{50} or limit test data based on a 48 hour observation period may be used in place of a 14 day observation period.

[Amdt. 173-190, 50 FR 41096, Oct. 8, 1985]

EFFECTIVE DATE NOTE: Section 173.3a was added at 50 FR 41096, Oct. 8, 1985, effective January 1, 1986.

§ 173.4 Exceptions for small quantities.

(a) Small quantities of Flammable liquids, Flammable solids, Oxidizers, Organic peroxides, Corrosive materials, Poison B, and ORM A, B, C, and Radioactive materials that also meet the definition of one or more of these hazard classes are not subject to any other requirements of this subchapter if:

(1) The maximum quantity of material per inner receptacle is limited to:

(i) Thirty (30) milliliters for authorized liquids, other than poisons;

(ii) Thirty (30) grams for authorized solids, other than poisons;

(iii) One (1) gram for authorized materials classed as Poison B or subject to the "Poison-Inhalation Hazard" shipping paper description requirements of §172.203(k)(4); and

(iv) An activity level not exceeding that specified in §§ 173.421, 173.422, or 173.424, as appropriate, for a package containing a radioactive material;

(2) With the exception of temperature sensing devices, each inner receptacle:

(i) Is not liquid-full at 130°F, and

(ii) Is constructed of plastic having a minimum thickness of no less than 0.008-inch (0.2 millimeters), or earthenware, glass, or metal;

(3) Each inner receptacle with a removable closure has its closure held securely in place with wire, tape, or another positive means;

(4) Unless equivalent cushioning and absorbent material surrounds the inside packaging, each inner receptacle is securely packed in an inside packaging with cushioning and absorbent material that:

(i) Will not react chemically with the material, and

(ii) Is capable of absorbing the entire content (if a liquid) of the receptacle;

(5) The inside packaging is securely packed in a strong outside packaging;

(6) The completed package, as demonstrated by prototype testing, is capable of sustaining:

(i) Each of the following free drops made from a height of 6-feet direct onto a solid unyielding surface without breakage or leakage from any inner receptacle and without a substantial reduction in the effectiveness of the package:

(A) One drop flat on bottom;

(B) One drop flat on top;

(C) One drop flat on the long side;

(D) One drop flat on the short side; and

(E) One drop on a corner at the junction of three intersecting edges; and

(ii) A compressive load in pounds determined by multiplying by two the maximum horizontal cross section of the package (in square inches) in the position in which it would normally be transported without a substantial reduction in effectiveness; the load shall be applied continuously during a period of 24 hours, uniformly against the top and bottom of the package which is in the position in which it is intended to be normally transported.

NOTE: Each of the above tests may be performed on a different, but identical, package i.e., all tests need not be performed on the same package.

(7) Placement of the material, or packing it with different materials, in the package does not result in a violation of § 173.21;

(8) The gross weight of the completed package does not exceed 65 pounds;

(9) The shipper certifies conformance with this section by marking the outside of the package with the statement: "This package conforms to conditions and limitations specified in 49 CFR 173.4";

(10) The package is not opened or otherwise altered until it is no longer in commerce; and

(11) The package, unless approved by the Director, OHMT, does not contain a material assigned any of the following identification numbers associated with the hazardous materials description in § 172.101 or § 172.102 of this subchapter:

1092
1131
1259
1380
1397
1419
1422
1432
1433
1491
1504
1749
1798
1831
1873
2031
2032
2495
2626
2813
2845
2924
2925
9191
9193

(b) A package containing a radioactive material also must conform with the requirements of § 173.421(a) through (e) or § 173.422(a) through (f). After May 2, 1987, a package containing a radioactive material may not be offered for transportation aboard a passenger-carrying aircraft unless that material is intended for use in, or incident to, research, medical diagnosis or treatment.

[Amdt. 173-167, 48 FR 30136, June 30, 1983; 49 FR 19026, May 4, 1984, as amended by Amdt. 173-187, 50 FR 18667, May 2, 1985; Amdt. 173-190, 50 FR 41097, Oct. 8, 1985]

EFFECTIVE DATE NOTE: Section 173.4 was amended at 50 FR 41097, Oct. 8, 1985, by revising paragraph (a)(1)(iii), effective January 1, 1986. For the convenience of the user, the superseded text is set forth below.

§ 173.4 Exceptions for small quantities.

(c) * * *

(1) * * *

* * * * *

(iii) One (1) gram for authorized materials classed as Poison B; and

* * * * *

§ 173.5 Agricultural operations.

(a) Formulated agricultural chemicals which are offered for transportation in less-than-case-lot quantities, or when repackaged, are not subject to Subpart D of Part 172 of this subchapter and the outside specification packaging requirements of Part 173 of this subchapter if all of the following conditions are met:

(1) Inside packagings are enclosed in strong outside packagings. Inside liquid packagings are cushioned, if necessary, to prevent breakage and leakage;

(2) Each inside packaging does not exceed 1-gallon capacity for liquids nor 25 pounds for dry materials;

(3) Gross weight of less-than-case or repackaged lots is not over 100 pounds in each vehicle;

(4) Transportation is authorized only by private motor vehicle between a final distribution point and the ultimate point of application, if that distance does not exceed one hundred miles.

(b) Formulated liquid agricultural chemicals in specification packagings of 55 gallons capacity, or less, with closures manifolded to a closed mixing system and equipped with positive dry disconnect devices may be transported by a private motor carrier between a final distribution point and an ultimate point of application or loading aboard an aircraft for aerial application.

(c) See § 173.315(m) pertaining to nurse tanks.

[Amdt. 173-165, 48 FR 28099, June 20, 1983]

§ 173.6 Shipments by air.

(a) *General shipping requirements.* When the regulations indicate a hazardous material is forbidden aboard cargo-aircraft only, the material is also forbidden aboard passenger-carrying aircraft.

(b) *General packaging requirements.* (1) In addition to the requirements of this part and Parts 175 and 178 of this subchapter, for air shipments each packaging must be designed and constructed to prevent leakage that may be caused by changes in altitude and temperature during air transportation.

(2) Inner containers that are breakable (such as earthenware, glass, or brittle plastic), must be packaged to prevent breakage and leakage under conditions normally incident to transportation. These completed packagings must be capable of withstanding a 4-foot drop on solid concrete in the position most likely to cause damage. Cushioning and absorbent materials must not be capable of reacting dangerously with the contents. Where any plastic packaging is specified in this part, a plastic bag or pouch is not permitted unless specifically authorized.

(3) For any packaging with a capacity of 110 gallons or less containing liquids, sufficient outage (ullage) must be provided to prevent liquid contents from completely filling the packaging at 130° F. The primary packaging (which may include composite packaging), for which retention of the liquid is the basic function, must be capable of withstanding, without leakage, an internal absolute pressure of no less than 26 lbs./sq. inch or no less than the sum of the absolute vapor pressure of the contents at 130° F. (55° C.) and the atmospheric pressure at sea level, whichever is greater.

(4) Stoppers, corks, or other such friction-type closures must be held securely, tightly, and effectively in place with wire, tape, or other positive means. Each screw-type closure on any inside plastic packaging must be secured to prevent the closure from loosening due to vibration or substantial changes in temperature.

(5) Bags permitted by regulations as outside packaging for transportation aboard aircraft must be water resistant.

(6) For any cylinder containing hazardous materials incorporating valves, sufficient protection must be provided to prevent operation and damage to

such valves during transportation, by one of the following methods:

(i) By equipping each cylinder with securely attached valve caps or protective headrings, or

(ii) By boxing or crating of the cylinder.

(7) Tank cars and tank motor vehicles containing hazardous materials may not be transported aboard aircraft.

(c) *Special labeling requirements.* See "Magnetized materials" in §§ 172.101 and 173.1020 of this subchapter and see § 172.101 for cargo-only aircraft labeling requirements.

(d) No person may offer for transportation aboard aircraft an overpack containing hazardous materials which require segregation under the provisions of § 175.78 of this subchapter.

[Amdt. 173-94, 41 FR 16063, Apr. 15, 1976, as amended by Amdt. 173-94B, 41 FR 57068, Dec. 30, 1976; Amdt. 173-16, 48 FR 50461, Nov. 1, 1983; Amdt. 173-170, 48 FR 53712, Nov. 29, 1983]

§ 173.7 U.S. Government material.

(a) Hazardous materials offered for transportation by, for, or to the Department of Defense (DOD) of the U.S. Government, including commercial shipments pursuant to a DOD contract, must be packaged in accordance with the regulations in this subchapter or in packagings of equal or greater strength and efficiency as certified by DOD pursuant to the "Policies and Procedures for Hazardous Materials Packaging Certification, AFLCR 800-29/AFSCR 800-29/ DARCOM-R 700-103/NAVMATINST 4030.11/DLAR 4145.37." Hazardous materials offered for transportation by DOD under this provision may be reshipped by any shipper to any consignee provided the original packaging has not been damaged or altered in any manner.

(1) Hazardous materials sold by the DOD in packagings that are not marked in accordance with the requirements of this subchapter may be shipped from DOD installations if the DOD certifies in writing that the packagings are equal to or greater in strength and efficiency than the packaging prescribed in this subchapter. The shipper shall obtain such a certification in duplicate for each shipment. He shall give one copy to the originating carrier and retain the other for no less than 1 year.

(b) Shipments of radioactive materials, made by or under the direction or supervision of the U.S. Department of Energy or the Department of Defense, and which are escorted by personnel specifically designated by or under the authority of those agencies, for the purpose of national security, are not subject to the regulations in Parts 170-189 of this subchapter.

(c) Shipments of explosive samples, not exceeding one gram net weight, offered by and consigned to the Bureau of Alcohol, Tobacco and Firearms (ATF) of the Department of the Treasury are not otherwise subject to the regulations in Parts 110-189 of this subchapter when placed in a specifically designed multi-unit assembly packed in a strong outside packaging. The packaging must be of a type accepted by ATF as capable of precluding a propagation of any explosion outside the packaging. The second component from the outside of the packaging must be marked or tagged to indicate the presence of an explosive.

(d) Notwithstanding the requirements of §§ 173.416 and 173.417 of this subchapter, packagings made by or under the direction of the U.S. Department of Energy may be used for the transportation of radioactive materials when evaluated, approved, and certified by the Department of Energy against packaging standards equivalent to those specified in 10 CFR Part 71. Packages shipped in accordance with this paragraph shall be marked and otherwise prepared for shipment in a manner equivalent to that required by this subchapter for packagings approved by the Nuclear Regulatory Commission.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[29 FR 18671, Dec. 29, 1964, as amended by Order 74, 32 FR 5274, Mar. 29, 1967. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.7, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.9 Cars, truck bodies or trailers containing lading which has been fumigated or treated with flammable liquids, flammable gases, poisonous liquids or solids, or poisonous gases.

(a) Delivery of rail cars, freight container, or trailers containing lading, fumigated or treated with flammable liquid or flammable gas for transportation by rail carrier is prohibited until 48 hours have elapsed after such fumigation or treatment, or until cars, truck bodies or trailers have been ventilated so as to remove danger of fire or explosion due to the presence of flammable vapors.

(b) Rail cars, truck bodies or trailers containing lading which has been fumigated or treated with poisonous liquid, solid, or gas, such as carbolic acid, liquid or solid, chlorpicrin, hydrocyanic acid, methyl bromide, etc., must be placarded on each door or near thereto with placard as described below (for cleaning cars see § 174.615 of this subchapter):

(Reduced size)

(Red lettering on white cardboard)

10 inches

8 inches

DANGER

The lading of this car has been
FUMIGATED or
TREATED
with

____

(Name of poisonous liquid, solid, or gas)

BEFORE UNLOADING, open both doors and DO NOT ENTER until car is free of gas. REMOVE ALL POISONOUS MATERIAL before release of empty car.

[29 FR 18773, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967; Amdt. 173-94, 41 FR 16087, Apr. 15, 1976, and amended by Amdt. 173-94A, 41 FR 40684, Sept. 20, 1976. Redesignated by Amdt. 173-162, 48 FR 10226, Mar. 10, 1983]

§ 173.10 Tank car shipments.

(a) Tank cars containing any flammable gas (including a cryogenic liquid) or flammable liquid, except liquid road asphalt or tar, may not be offered for transportation unless originally consigned or subsequently reconsigned to parties having private-siding (see Note 1 of this section) or to parties using railroad siding facilities which have been equipped for piping the liquid from tank cars to permanent storage tanks of sufficient capacity to receive contents of car.

(b) A tank car containing any compressed gas must not be offered for transportation unless the car is consigned for delivery (see paragraph (c) of this section) and unloading on a private track (see Note 1 of this section) except that where no private track is available, delivery and unloading on carrier tracks is permitted provided the following conditions are complied with:

(1) Any tank car of DOT-106A or 110A type (see §§ 179.300 and 179.301 of this subchapter) may be offered for transportation and the loaded unit tanks may be removed from car frame on carrier tracks, provided the shipper has obtained from the delivering carrier and filed with originating carrier, written permission (see Note 2 of this section) for such removal. The consignee must furnish adequately safe mechanical hoist, obtained from the carrier if desirable, by which the tanks shall be lifted from the car and deposited directly upon vehicles furnished by the consignee for immediate removal from carrier property or tanks must be lifted by adequately safe mechanical hoist from car directly to vessels for further transportation

(c) Any tank car of other than DOT-106A or 110A type (see §§ 179.300 and 179.301 of this subchapter), containing anhydrous ammonia, liquefied hydrocarbon or liquefied petroleum gas, and having interior pipes of liquid and gas discharge valves equipped with check valves, may be consigned for delivery and unloading on carrier tracks, if the lading is piped directly from the car to permanent storage tanks of sufficient capacity to receive the entire contents of the car. Such cars may also be consigned for storage on a private track or on a carrier track when designated by the carrier for such storage.

(d) For cars of the DOT-106A or 110A type (see §§ 179.300 and 179.301 of this subchapter), the tanks must be placed in position and attached to the car structure by the shipper.

(e) Flammable liquids and flammable gases (including a cryogenice liquid) may not be loaded into tank cars on carrier property from tank trucks or drums.

NOTE 1: For this purpose, a private track is a track outside of carrier's right-of-way, yard, and terminals, and of which the carrier does not own either the rails, ties, roadbed or right-of-way; or a track or portion of a track which is devoted to the purpose of its user, either by lease or written agreement; in which case the lease or written agreement will be considered as equivalent to ownership.

NOTE 2: Carriers should give permission for the unloading of these containers on carrier tracks only where no private siding is available within reasonable trucking distance of final destination. The danger involved is the release of compressed gases due to accidental injury to container in handling. The exposure to this danger decreases directly with the isolation of the unloading point.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[29 FR 18773, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and by Amdt. 173-162, 48 FR 10226, Mar. 10, 1983, and amended by Amdt. 173-180, 49 FR 42735, Oct. 24, 1984]

§ 173.11 Shipper's registration statement; flammable cryogenic liquids.

(a) No person may offer a flammable cryogenic liquid for transportation in a portable tank, cargo tank or a tank car unless he has filed a registration statement by certified mail, return receipt requested, with the Director, OHMT, RSPA, in accordance with paragraphs (b), (c) and (d) of this section.

(b) The registration statement must contain the following information:

(1) The shipper's name and principal place of business;

(2) Location where flammable cryogenic liquids are offered for transportation, including transportation by private carriage;

(3) The name and principal place of business of each initial carrier used to transport flammable cryogenic liquids and the name of each flammable cryogenic liquid the carrier is offered for transportation; and

(4) The serial number or vehicle identification number of each portable tank and cargo tank, and the reporting mark and number of each tank car, owned, leased, or otherwise controlled by the shipper and used to offer a flammable cryogenic liquid for transportation.

(c) The registration statement must be filed:

(1) Initially between January 1 and February 28, 1985 (this initial statement is only required to contain information regarding operations that took place during the 90 days prior to the date of the statement); and

(2) Subsequently, between July 1 and August 31 of each odd numbered year after 1985.

(d) For operations begun between the two-year filing intervals specified in paragraph (c) of this section, the information must be provided on the registration statement filed during the next required filing period.

(Approved by the Office of Management and Budget under control number 2137-0541)

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 173-166, 48 FR 27692, 27713, June 16, 1983; 48 FR 50440, 50441, Nov. 1, 1983]

§ 173.12 Exceptions for shipment of waste material.

(a) *General.* Waste material meeting the hazard class definition of a flammable liquid, flammable solid, oxidizer, corrosive material, Posion B or ORM-A, B, C, and E are excepted from the specification packaging requirements of this subchapter if packaged in combination packagings in accordance with this section and transported for disposal or recovery by private or contract motor carrier by highway only. In addition, a generic proper shipping name from § 172.101 may be used in place of specific chemical names, when two or more waste materials in the same hazard class are packaged in the same outside packaging, provided the waste materials are chemically compatible.

(b) *Outside packagings.* The outside packaging must be a DOT specification metal or fiber drum. It may also be a polyethylene drum capable of withstanding: (1) The vibration and compression tests specified in § 178.19-7(c) (1) and (2), except the compression test value must be no less than 2400 pounds, and (2) a four-foot drop test as specified in § 178.19-7(a)(1).

(c) *Inside packagings.* The inside packagings must be either glass packagings not exceeding 1-gallon rated capacity, or metal or plastic packagings not exceeding a rated capacity of 5 gallons.

(d) *Additional packaging requirements.* The following additional requirements are applicable:

(1) Each outside packaging may only contain one hazard class and the materials must be chemically compatible;

(2) Inside packagings of liquid must be surrounded by a compatible absorbent material capable of absorbing the total liquid contents; and

(3) Gross weight may not exceed 450 pounds or the rated capacity of the drum; whichever is less.

(e) *Prohibited materials.* The following materials are not authorized under the provisions of this section: acrolein; bromine pentafluoride; bromine trifluoride; chloric acid, chlorine trifluoride, nitric acid, fuming; pyroforic liquids; and sulfuric acid, fuming.

[Amdt. 173-187, 50 FR 11702, Mar. 25, 1985]

Subpart B—Preparation of Hazardous Materials for Transportation

§ 173.21 Forbidden materials and packages.

Unless otherwise provided in this subchapter, the offering for transportation of the following is forbidden:

(a) A hazardous material in the same packaging, freight container, or overpack with another hazardous material, the mixing of which would be liable to cause a dangerous evolution of heat or gas, or produce corrosive materials, except as provided in §§ 173.152(a) and 173.242(a) and (b).

(b) A package containing a material which is liable to decompose or polymerize at a temperature of 130°F. (54.4°C.) or less with an evolution of a dangerous quantity of heat or gas unless stabilized or inhibited in a manner that will preclude such evolution.

(1) The determination of whether a material is forbidden under this paragraph may be made by one of the following methods: Standard Method of Test for Constant Temperature Stability of Chemical Materials (ASTM E-487-74) or the Self Accelerating Decomposition Temperature (SADT) Test published by the Organic Peroxide Producers' Safety Division (OPPSD).

(2) Refrigeration may be used as a means of stabilization only when approved by the Director, Office of Hazardous Materials Transportation, RSPA. (For status of approvals issued by the Bureau of Explosives, see § 171.19 of this subchapter.)

(3) For organic peroxides, the decomposition temperature of 130°F.(54.4°C) does not apply if the controlled temperature requirements specified in Chapter 11 of the UN Recommendations are applied to determine when refrigeration is required.

(c) Packages which evolve a dangerous quantity of flammable gas or vapor released from a material which would not otherwise be subject to this subchapter, i.e., the release of flammable vapor or gas in such quantities that a flammable mixture with air would be created within a transport vehicle.

(d) Packages containing materials (other than those classed as explosives) which will detonate in a fire. For the purposes of this paragraph, a detonation is a type of explosion in which a shock wave travels through the material at a speed greater than the speed of sound in the undecomposed material. When tests are required to evaluate a package under the provisions of this paragraph, the testing must be done or approved by one of the agencies specified in § 173.86.

(e) Any package containing a cigarette lighter or other similar device with fuel and equipped with an ignition element, unless the design of the device and its packaging insofar as they affect safety in transportation have been examined by the Bureau of Explosives (B of E) and approved by the Director, Office of Hazardous Materials Transportation, RSPA. (An approval which was issued by the B of E remains valid to the same extent as if it had been issued by RSPA.) For lighters containing gases, also see § 173.308.

[Amdt. 173-137, 45 FR 34702, May 22, 1980, as amended by Amdt. 173-137, 45 FR 74669, Nov. 10, 1980; Amdt. 173-158, 47 FR 43065, Sept. 30, 1982]

§ 173.22 Shipper's responsibility.

(a) Except as otherwise provided in this part, a person may offer a hazardous material for transportation in a packaging or container required by this part only in accordance with the following:

(1) The person shall class and describe the hazardous material in accordance with Parts 172 and 173 of this subchapter, and

(2) The person shall determine that the packaging or container has been manufactured, assembled, and marked in accordance with:

(i) Section 173.7(a) and Parts 173, 178, or 179 of this subchapter;

(ii) A specification of the Department in effect at the date of manufacture of the packaging or container;

(iii) An approval issued under this subchapter; or

(iv) An exemption issued under Subchapter B of this chapter.

(3) In making the determination under paragraph (a)(2) of this section, the person may accept:

(i) The manufacturer's certification, specification, approval, or exemption marking (see §§ 178.0-2 and 179.1 of this subchapter); or

(ii) With respect to cargo tanks provided by a carrier, the manufacturer's identification plate or a written certification of specification or exemption provided by the carrier.

(b) When a person performs a function covered by or having an effect on a specification prescribed in Part 178 or 179 of this subchapter, an approval issued under this subchapter, or an exemption issued under Subchapter B of this chapter, that person must perform the function in accordance with that specification, approval, or exemption, as appropriate.

(c) Prior to each shipment of fissile radioactive materials, and Type B or highway route controlled quantity packages of radioactive materials (see § 173.403), the shipper shall notify the consignee of the dates of shipment and expected arrival. The shipper shall also notify each consignee of any special loading/unloading instructions prior to his first shipment. For any shipment of irradiated reactor fuel, the shipper shall provide physical protection in compliance with a plan established under:

(1) Requirements prescribed by the U.S. Nuclear Regulatory Commission, or

(2) Equivalent requirements approved by the Director, Office of Hazardous Materials Transportation, RSPA.

(d) Within 90 days following acceptance by a carrier of any package containing a highway route controlled quantity of radioactive material (see § 173.403(l)) for transportation by public highway, the shipper shall file the following information with the Director, Office of Hazardous Materials Transportation, RSPA (this paragraph does not apply to packages shipped in compliance with physical security requirements of the U.S. Nuclear Regulatory Commission in 10 CFR Part 73):

(1) The route plan required under § 177.825(c) of this subchapter (any supplement to the route plan prepared in accordance with § 177.825(c) of this subchapter shall be filed within 90 days of receipt from the carrier);

(2) A statement identifying the name and address of the shipper, carrier and consignee; and

(3) A copy of the shipping paper or the description of the radioactive material required by §§ 172.202 and 172.203 of this subchapter.

(49 U.S.C. 1803, 1804, 1808, and 1809; 49 CFR 1.53, App. A to Part 1)

[Amdt. 173-100, 42 FR 2689, Jan. 13, 1977, and Amdt. 173-143, 46 FR 5316, Jan. 19, 1981, as amended by Amdt. 173-161, 48 FR 2655, Jan. 20, 1983; Amdt. 173-162, 48 FR 10226, Mar. 10, 1983; 48 FR 13431, Mar. 31, 1983; Amdt. 173-161, 48 FR 17094, Apr. 21, 1983]

§ 173.22a Use of packagings authorized under exemptions.

(a) Except as provided in paragraph (b) of this section, no person may offer a hazardous material for transportation in a packaging the use of which is dependent upon an exemption issued under Subpart B of Part 107 of this title, unless that person is the holder of or a party to the exemption.

(b) If an exemption authorizes the use of a packaging for the shipment or transportation of a hazardous material by any person or class of persons other than or in addition to the holder of the exemption, that person or a member of that class of persons may use the packaging for the purposes authorized in the exemption subject to the terms specified therein. However, no person may use a packaging under the authority of this paragraph unless he maintains a copy of the exemption at each facility where the packaging is being used in connection with the shipment or transportation of the hazardous material concerned. Copies of exemptions may be obtained from the Office of Hazardous Materials Transportation, U.S. Department of Transportation, Washington, D.C. 20590, Attention: Docket Section.

[Amdt. 173-93, 41 FR 3478, Jan. 23, 1976, as amended by Amdt. 173-121, 43 FR 48643, Oct. 19, 1978]

§ 173.23 Previously authorized packaging.

(a) Where the regulations specify Specification 34 polyethylene drums, a polyethylene drum manufactured and marked in accordance with a DOT exemption may be used if the polyethylene drum conforms to Specification 34 except for the specification marking required by §178.19-6(a)(2) of this subchapter and the drum is legibly marked "DOT-34" in characters at least one half inch in height in a location near the exemption marking.

(b) [Reserved]

(c) After July 2, 1982, a seamless aluminum cylinder manufactured in conformance with and for use under DOT exemption E 6498, E 7042, E 8107, E 8364, or E 8422, may be continued in use if marked before or at the time of the next retest with the specification identification "3AL" immediately above the exemption number, or the DOT mark (i.e., DOT 3AL 1800) is added in proximity to the exemption marking.

(d) Cylinders (spheres) manufactured and marked DOT-E 6616 prior to January 1, 1983, may be continued in use if marked before or at the time of the next retest with the specification identification "4BA" near the exemption marking.

(e) After October 1, 1984, cylinders manufactured for use under exemptions DOT E-6668 or E-8404 may be continued in use, and must be marked "DOT-4LXXXYY" (XXX to be replaced by the service pressure, YY to be replaced by the letters "AL", if applicable) in compliance with Specification 4L (§ 178.57 of this subchapter) on or before January 1, 1986. The "DOT-4LXXXYY" must appear in proximity to other required specification markings.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 173-3, 33 FR 14921, Oct. 4, 1968, as amended by Amdt. 173-90, 39 FR 45240, Dec. 31, 1974; Amdt. 173-94; 41 FR 16063, Apr. 15, 1976; Amdt. 173-152, 47 FR 13817, Apr. 1, 1982; 47 FR 26633, June 21, 1982; Amdt. 173-16, 48 FR 50460, Nov. 1, 1983; Amdt. 173-176, 49 FR 24689, June 14, 1984; Amdt. 173-180, 49 FR 42735, Oct. 24, 1984]

§ 173.24 Standard requirements for all packages.

(a) Each package used for shipping hazardous materials under this subchapter shall be so designed and constructed, and its contents so limited, that under conditions normally incident to transportation:

(1) There will be no significant release of the hazardous materials to the environment;

(2) The effectiveness of the packaging will not be substantially reduced; and

(3) There will be no mixture of gases or vapors in the package which could, through any credible spontaneous increase of heat or pressure, or through an explosion, significantly reduce the effectiveness of the packaging.

(b) Materials for which detailed specifications for packaging are not set forth in this part must be securely packaged in strong, tight packages meeting the requirements of this section.

(c) Packaging used for the shipment of hazardous materials under this subchapter shall, unless otherwise specified or exempted therein, meet all of the following design and construction criteria:

(1) Each specification container must be marked as follows:

(i) In an unobstructued area with letters and numerals identifying the container specification (e.g., DOT-1A, DOT-17E-304HT, DOT-23G40). See § 178.0-2 of this subchapter.

(ii) The name and address or symbol of person making the mark specified in paragraph (c)(1)(i) of this section. Symbol letters, if used, must be registered with the Director, OHMT. Duplicate symbols are not authorized.

(iii) The markings must be stamped, embossed, burned, printed, or otherwise marked on the packaging to provide adequate accessibility, permanency, and contrast so as to be readily apparent and understood.

(iv) Unless otherwise specified, letters and numerals must be at least ½ inch high.

(v) Packaging which does not comply with the applicable specification listed in Parts 178 and 179 of this subchapter must not be marked to indicate such compliance (see § 178.0-2 and § 179.1 of this subchapter).

(2) Steel used shall be low-carbon, commercial quality steel. Stainless, open hearth, electric, basic oxygen, or other similar quality steels are acceptable. Steel sheets of specified gauges shall comply with the following:

Gauge No	Nominal thickness (inches)	Minimum thickness (inches)
12	0.1046	0.0946
13	0.0897	0.0817
14	0.0747	0.0677
15	0.0673	0.0603
16	0.0598	0.0533
17	0.0538	0.0476
18	0.0478	0.0428
19	0.0418	0.0378
20	0.0359	0.0324
22	0.0299	0.0269
23	0.0269	0.0239
24	0.0239	0.0209
26	0.0179	0.0159
28	0.0149	0.0129
30	0.0120	0.0110

(3) Lumber used shall be well seasoned, commercially dry, and free from decay, loose knots, knots that would interfere with nailing, and other defects that would materially lessen the strength.

(4) Welding and brazing shall be performed in a workmanlike manner using suitable and appropriate techniques, materials, and equipment.

(5) Packaging materials and contents shall be such that there will be no significant chemical or galvanic reaction among any of the materials in the package.

(6) Closures shall be adequate to prevent inadvertent leakage of the contents under normal conditions incident to transportation. Gasketed closures shall be fitted with gaskets of efficient material which will not be deteriorated by the contents of the container.

(7) Nails, staples, and other metallic devices shall not protrude into the interior of the outer packaging in such a manner as to be likely to cause failures.

(8) The nature and thickness of the packaging shall be such that friction during transport does not generate any heating likely to decrease the chemical stability of the contents.

(d) *Polyethylene packagings and receptacles.* (1) Polyethylene used in packagings and receptacles must be of a type compatible with the lading and may not be permeable to an extent that a hazardous condition occurs during transportation, handling or refilling.

(2) Each polyethylene packaging or receptacle which is used for liquid hazardous materials must be capable of withstanding without failure the procedure specified in Appendix B of this part ("Procedure for Testing Chemical Compatibility and Rate of Permeation in Polyethylene Packagings and Receptacles") and the maximum rate of permeation of hazardous lading through or into the polyethylene packaging or receptacles may not exceed the following rates:

(i) 0.5 percent for materials meeting the definition of a poison according to this subchapter and 2.0 percent for other hazardous materials, when subjected to temperatures no lower than 18°C. (64°F.) for 180 days in accordance with Test Method 1;

(ii) 0.5 percent for materials meeting the definition of a poison according to this subchapter and 2.0 percent for other hazardous materials, when subjected to a temperature no lower than

50°C. (122°F.) for 28 days in accordance with Test Method 2; or

(iii) 0.5 percent for materials meeting the definition of a poison according to this subchapter and 2.0 percent for other hazardous materials, when subjected to a temperature no lower than 60°C. (140°F.) for 14 days in accordance with Test Method 3.

(3) Alternative procedures or rates of permeation are permitted if they yield a level of safety equivalent to or greater than that provided by paragraph (d)(2) of this section and are approved by the Director, OHMT.

(4) Each polyethylene packaging used as an outside packaging for materials meeting the definition of a poison according to this subchapter shall be permanently marked, by embossment or other durable means, with the word "POISON" in letters of at least ¼ inch in height. Additional text or symbols may be included in the marking. The marking shall be located within six inches of the packaging's closure. The requirements of this subparagraph do not apply prior to September 1, 1985.

(e) For specification containers, compliance with the applicable specifications in Parts 178 and 179 of this subchapter shall be required in all details, except as otherwise provided in this subchapter.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 173-3, 33 FR 14921, Oct. 4, 1968]

EDITORIAL NOTES

1. For Federal Register citations affecting § 173.24, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

2. The information collection requirements contained in § 173.24(d)(3) are pending approval by the Office of Management and Budget. Notice will be published in the Federal Register announcing the approval number and the effective date.

§ 173.25 Authorized packages and overpacks.

(a) Except as provided in paragraph (b) of this section, authorized packages containing hazardous materials may be offered for transportation when tightly packed in a strong overpack, if all of the following conditions are met:

(1) The package meets the requirements of §§ 173.21 and 173.24 of this subchapter.

(2) The overpack is marked with the proper shipping name and identification number, and labeled as required by this subchapter for each hazardous material contained therein unless markings and labels representative of each hazardous material in the overpack are visible.

(3) Each package subject to the orientation marking requirements of § 172.312 of this subchapter is packed in the overpack with its filling holes up and the overpack is marked "THIS END UP" or "THIS SIDE UP" (as appropriate) to indicate the upward position of closures.

(4) The overpack is marked with a statement indicating that the inside (inner) packages comply with prescribed specifications when specification packagings are required, unless specification markings on the inside packages are visible.

(b) In addition to the requirements of paragraph (a) of this section, authorized packages containing corrosive liquids must meet the following conditions:

(1) Packages containing nitric acid (over 40% concentration), perchloric acid, hydrogen peroxide solution (over 52% strength by weight), nitrohydrochloric or nitrohydrochloric acid diluted are not overpacked; and

(2) Other corrosive liquids are not to be overpacked with any other hazardous material, except as follows:

(i) As provided in §§ 173.242, 173.257, 173.258, 173.259, 173.260, 173.261, and 173.286 of this subchapter; and

(ii) Acid or alkaline battery fluid in packages prescribed by §§ 173.257 and 173.258 of this subchapter may be included in overpacks with storage batteries when packed to prevent movement within the overpack.

[Amdt. 173-165, 48 FR 28099, June 20, 1983]

§ 173.26 Quantity limitations and metric measurements.

(a) When quantity limitations are specified in this subchapter only by U.S. liquid measure for 110 gallons or less, or only by avoirdupois weight for 1,000 pounds or less, quantities measured in metric units may be substituted on an equivalent basis and up to and including one liter per quart and 500 grams per pound. When metric measurements are used, specification packagings must be marked to indicate their use and must be tested accordingly. Symbols for metric markings are L for liter, mL for milliliter, kg for kilogram, and g for gram.

(b) When quantity limitations do not appear in the packaging requirements of this subchapter, the permitted gross weight or capacity authorized for a container to be offered for transportation is as shown in the container specification. (See also § 173.27.)

[Amdt. 173-94, 41 FR 16064, Apr. 15, 1976, as amended by Amdt. 173-122, 43 FR 56044, Nov. 30, 1978]

§ 173.27 Aircraft quantity limitations.

(a) The maximum quantity of hazardous material that may be offered for transportation by air in a package that is required for the material by this subchapter may not exceed that quantity prescribed for the material in § 172.101 of this subchapter.

(b) When offered for transportation by air, the combined quantity of any one class of materials may not exceed the lowest maximum quantity prescribed in § 172.101 of this subchapter for any one of the materials in that class contained in the same package that meets the minimum requirements for the material contained therein.

[Amdt. 173-94, 41 FR 16064, Apr. 15, 1976]

§ 173.28 Reuse of packagings (containers).

(a) Containers used more than once (refilled and reshipped after having been previously emptied) must be in such condition, including closure devices and cushioning materials, that they comply in all respects with the prescribed requirements for those containers. Repairs must be made in an efficient manner in accordance with requirements for materials and construction as prescribed in Parts 178 and 179 of this subchapter for new containers, or as otherwise prescribed. Parts that are weak, broken, or otherwise deteriorated must be replaced.

(1) Retest of carboy packages must have been made by or for shippers, or their authorized agents, as required by applicable provisions of the specifications in Part 178 of this subchapter before carboys which are to be offered for transportation are filled.

NOTE 1: Tests not required by shipper who fills and ships or who reships filled carboys for one shipment only carboy packages which have been properly tested by another shipper or a duly authorized agency.

(b) Markings applied as prescribed by the specifications must be maintained in a legible condition.

(c) If, on account of painting or any other reason, the markings as prescribed for any container cannot be kept plain and legible, a metal plate, brazed or soldered, or otherwise securely fastened to the container, with a reproduction of the prescribed markings plainly stamped thereon, will be permitted.

(d) Packagings previously used for any hazardous material must have the old markings (other than markings which are required by this subchapter to be permanent) and labels, if any, thoroughly removed or obliterated before being used for other materials.

(e) Boxes previously used for high explosives containing a liquid explosive ingredient not contained in an inside metal container must not be again used for shipments of any character.

(1) Boxes that have been contaminated by liquid explosive composition must not again be used for shipments of any character.

(f) Kegs previously used for any chlorate must not be again used for shipments of any character.

(g) Metal kegs previously used for black powder not contained in an interior package must not be again used for shipment of any explosive.

NOTE 1: Until further order of the Department, metal kegs, previously used for the shipment of black powder not contained in an interior package, may be used provided the kegs are in good physical condition and are not liable to permit escape of contents during transportation. Empty kegs previously used for shipment of black powder must be entirely free of black powder on the inside and outside before being offered for transportation.

(h) Except as provided in paragraphs (m), (n), and (p) of this section, single-trip containers (marked STC) and nonreusable containers (marked NRC) subject to the specification requirement of Part 178 of this subchapter from which contents have been removed following use for transportation of any material, may not be used thereafter for the transportation of hazardous materials.

(i) Polyethylene packagings previously used for poisonous materials should not be reused for any materials other than poisonous materials or hazardous wastes.

(j) [Reserved]

(k) Containers used for shipments of etching acid liquid, n.o.s. must not be reused for shipment of any commodity.

(l) Cylinders used in anhydrous hydrofluoric acid service must comply with the requirements of § 173.264(b)(1) and must not be used in any other service.

(m) Specifications 17C, 17E, and 17H steel drums (§§ 178.115, 178.116, 178.118 of this subchapter) from which contents have been removed, may be reused as prescribed in this part as packagings for shipment of flammable liquids, flammable solids, organic peroxides, oxidizers, poisons covered by § 173.370, radioactive materials, and corrosive liquids covered by §§ 173.249 and 173.249a, only if the following requirements, in addition to the other requirements of this section, are complied with prior to each reuse:

(1) Each drum must be thoroughly cleaned to remove all residues and foreign matter, inspected for deterioration or defects, and returned to its original shape and contour. All closure devices and parts must be removed (if removable), inspected for defects, and replaced as necessary. Each open head cover gasket must be replaced. Any drum which shows evidence of deterioration (e.g., visible pitting; creases; significant reduction in parent metal thickness from rust, corrosion, or cleaning processes; metal fatigue; or other material defects) or which cannot be returned to its original shape and contour does not qualify for reuse.

(2) The entire surface of each closed-head drum (and after December 31, 1971, each open-head drum, except for its removable head and adjacent chime area) must be tested for leakage by constant internal air pressure. The leakage test must be conducted by submersion under water, by completely covering the surface with soap suds or oil, or by some other method that will be equally sensitive. The air pressure must be maintained for a period of time sufficient to permit a complete inspection for leaks. The minimum air pressure for the test must be as follows:

Specification No.	Capacity	Minimum test pressure p.s.i.
17C	All	15
17E	Over 12 gallons	7
	12 gallons or less	5
17H	Over 12 gallons	7
	12 gallons or less	5

If leaking, the drum does not qualify for reuse.

(3) Marking:

(i) All previous test markings, commodity identification markings, and labels must be removed.

(ii) The outside of each drum qualifying for reuse under this section must be marked on the body within 10 inches of the top head with the following information: "Tested" (or "Inspected" as appropriate), the month and year of the test (or inspection, if an open-head drum) and the DOT registration number of the reconditioner. For example:

TESTED 2/70

DOT R1001

The registration number required for this marking must be obtained from the Office of Hazardous Materials Transportation, Department of Transportation, Washington, D.C. 20590.

(iii) Markings must be in at least ¼-inch figures and letters on a contrasting background.

(iv) The printed marking of the month and year of test is not required if each is clearly indicated by other means, such as perforations on a decal.

(n) A packaging marked as STC or NRC according to the specification requirements of Part 178 of this subchapter may be reused for the shipment of any corrosive solid, ORM-A, ORM-B, ORM-C, ORM-E or any material not required by this subchapter to be shipped in a DOT specification packaging. Paragraph (m) of this section does not apply to these materials.

(o) Any drum meeting one specification which has been altered to meet another specification must be capable of meeting the new specification in all respects.

(1) Each drum so altered must be inspected, tested, and marked in accordance with paragraph (m) of this section. In addition, the drum must:

(i) Bear the specification markings required by the specification under which it was originally manufactured, and

(ii) Bear both the old and the new specification identification in conjunction with the markings required by paragraph (m) of this section with the specification to which the drum is converted shown last, e.g., "17E/17H". For example:

17E/17H

TESTED 2/70

DOT R1001

(p) A packaging marked NRC or STC according to the specification requirements of Part 178 of this subchapter may be reused for the shipment of hazardous waste to designated facilities subject to the following conditions:

(1) Except as authorized by this paragraph, the waste must be packaged in accordance with this part and offered for transportation in accordance with the requirements of this subchapter.

(2) Transportation is performed by highway only.

(3) A package is not offered for transportation less than 24 hours after it is finally closed for transportation, and each package is inspected for leakage immediately prior to being offered for transportation.

(4) Each package is loaded by the shipper and unloaded by the consignee, unless the motor carrier is a private or contract carrier.

(5) The packaging may be used only once under this paragraph and may not be used again for shipment of hazardous materials except in accordance with paragraph (m) or (n) of this section.

[29 FR 18671, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.28, see the List of CFR Sections Affected in the Finding Aids section of this volume.

§ 173.29 Empty packagings, portable tanks, cargo tanks, and tank cars.

(a) Except as otherwise provided in this section, a packaging having a capacity of 110 gallons or less that previously contained a hazardous material may not be offered for transportation unless offered in the same manner as required when it previously contained a greater quantity of hazardous material.

(1) This paragraph does not apply to:

(i) A packaging that has been cleaned and purged of all residue, or

(ii) A packaging filled with a material that is not subject to this subchapter.

(2) The word "waste" does not have to be displayed as part of the marking required by § 172.300 of this subchapter on a packaging having a capacity of 110 gallons or less that contains only the residue of a hazardous material.

(3) Any packaging having a capacity of 110 gallons or less that contains only the residue of a hazardous material covered by Table 2 of § 172.504 of this subchapter:

(i) Does not have to be included in determining the applicability of the placarding requirements of that section, and

(ii) Is not subject to the shipping paper requirements of this subchapter when collected and transported by a contract or private carrier for reconditioning or reuse.

(4) Notwithstanding the stowage requirements in Columns 7(a) and (b) of the Table in § 172.101 or of the Optional Table in § 172.102 of this sub-

chapter, for transportation by water, empty drums or empty cylinders not meeting the exception in paragraph (a)(1) of this section may be stowed on deck or under deck. Also, these packagings are not subject to Subparts D through O of Part 176 of this subchapter.

(b) [Reserved]

(c) An empty portable tank, cargo tank, tank car or multi-unit tank car tank may not be offered for transportation unless:

(1) Each opening is tightly closed except heater coil inlet and outlet pipes of empty tank cars; and

(2) Except as otherwise specified in this subchapter it is offered for transportation in the same manner as when it previously contained a greater quantity of a hazardous material. This requirement, as well as other provisions in this subchapter, does not apply to any tank that has been cleaned or purged of all hazardous materials residue or when it is reloaded with a material not subject to this subchapter.

(d) An empty packaging bearing a label or marking that is described in this subchapter and that pertains to the identification of a hazardous material may not be offered for transportation, unless the packaging contains some of the hazardous material that previously required display of the label or marking. This prohibition does not apply to transportation in a transport vehicle or freight container if such a packaging is not visible during transportation and the packaging is loaded by the shipper and unloaded by the shipper or consignee.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 173-94B, 41 FR 57068, Dec. 30, 1976, as amended by Amdt. 173-137, 45 FR 34702, May 22, 1980; Amdt.173-137, 45 FR 74669, Nov. 10, 1980; Amdt. 173-162, 48 FR 10226, Mar. 10, 1983]

§ 173.30 Loading and unloading of transport vehicles.

A person who loads or unloads hazardous materials into or from a transport vehicle or vessel shall comply with the applicable loading and unloading requirements of Parts 174, 175, 176, and 177 of this subchapter.

[Amdt. 173-94, 41 FR 16064, Apr. 15, 1976]

§ 173.31 Qualification, maintenance, and use of tank cars.

(a) *General qualifications for use.* (1) Except as otherwise provided in paragraph (a)(2) of this section, every tank car used for the transportation of dangerous articles shall meet the requirements of the applicable specification and regulations for the transportation of the particular commodity. See paragraph (a)(3) of this section.

(2) Tanks prescribed in the following table are authorized for service provided they conform to all applicable safety requirements of this subchapter:

Specifications prescribed in current regulations	Other specifications permitted (subject to the notes)	Notes
105A200W	105A100W	1
105A 200A LW	105A100A LW	1
105A300W	ICC-105, 105A300	
105A400W	105A400	
105A500W	105A500	
105A600W	105A600	
106A500X	ICC-27, BE-27, 106A500	
106A800X	106A800	
107A * * *		2

NOTE 1: Tanks built as Spec. DOT-105A100-W or 105A100AL-W may be altered and reclassified as Spec. DOT 105A200W or 105A200ALW, respectively, by installing safety relief valves, retesting and stenciling in accordance with the applicable specification.

NOTE 2: The test pressures of tanks built in the United States prior to January 1, 1956, may be increased to conform with current Spec. DOT-107A except that tanks built prior to 1941 are not authorized. Original and revised test pressure must be indicated and may be shown on a plate attached to the bulkhead of the car.

(3) Unless otherwise specifically provided in this part:

(i) When class DOT-105A, 105AL, 106A, 109A-AL, 110A, 111A, 112A, 112S, 112T, 112J, 114A, 114S, 114T, or 114J tank car tanks are prescribed, the same class tanks having higher marked test pressures than those prescribed may also be used.

(ii) When class DOT-111AW1 tank car tanks are prescribed, class 111AW3 tank car tanks may also be used.

(iii) When class DOT-112A tank car tanks are prescribed, classes DOT-112S, 112T, and 112J tanks having equal or higher marked test pressures than those prescribed may also be used.

(iv) When class DOT-112S tank car tanks are prescribed, classes DOT-112T and 112J tanks having equal or higher marked test pressures than those prescribed may also be used.

(v) When class DOT-114A tank car tanks are prescribed, classes DOT-114S, 114T, and 114J tanks having equal or higher marked test pressures than those prescribed may also be used.

(vi) When class DOT-114S tank car tanks are prescribed, classes DOT-114T, and 114J tanks having equal or higher marked test pressures than those prescribed may also be used.

(vii) When a class DOT-105A tank car is prescribed, class DOT-105S and DOT-105J tank cars having equal or higher marked test pressures than those prescribed may also be used.

(viii) When class DOT-105S tank car tanks are prescribed, class DOT-105J tank cars having equal or higher marked test pressures than those prescribed may also be used.

(4) Tank cars and appurtenances may be used for the transportation of any commodity for which they are authorized. Tank cars proposed for a commodity service other than authorized, must be approved for such service by the Association of American Railroads' Committee on Tank Cars. Transfer of a tank car from one authorized service to another may be made only by the owner or owner's authorization. Classes DOT-105A-W, 109A-W, 111A-100-W-4, 112A-W, 114A-W tank cars may be used for any commodity for which they are approved by the Committee on Tank Cars and may be stenciled accordingly. When a tank car is stenciled to indicate that it is authorized for one commodity only, it must not be used for any other service.

NOTE 1: For additional requirements for tank cars for compressed gases, see § 173.314.

(5) After December 31, 1978, each Specification 112 and 114 tank car must be equipped with shelf couplers in accordance with § 179.105-6 of this subchapter.

(6) After February 28, 1982, each Specification 105 tank car shall be equipped with a coupler vertical restraint system in accordance with § 179.105-6 of this subchapter.

(7) After February 28, 1985, no person may load a DOT Specification tank car unless it is equipped with a coupler vertical restraint system in accordance with § 179.105-6 of this subchapter.

(8) For each tank car conforming to and used under an exemption issued before October 1, 1984, which authorized the transportation of a cryogenic liquid in a tank car, the owner or operator, if not the owner, shall remove the exemption number stenciled on the car and stamp the tank car with the appropriate Class DOT-113 Specification followed by the applicable exemption number, for example, "DOT-113D60W-E * * * *". (Asterisks to be replaced by the exemption number.) The owner or operator, if not the owner, of a tank car that is remarked in this manner shall retain on file a copy of the last exemption in effect during the period the tank car is in service. No modification of a tank car remarked under this paragraph is authorized unless made in conformance with an applicable requirement or provision of this subchapter.

(9) Specification DOT-113A175W, DOT-113C60W, DOT-113D60W, and DOT-113D120W tank cars may continue in use, but new construction is not authorized.

(10) Class DOT 105A and 105S tank cars, constructed of ASTM A212B steel to ASTM A300 low temperature requirements, that were authorized under DOT E-3992 may continue in service but new construction is not authorized.

(b) *Loading and shipping*—(1) *Examination before shipping.* When tanks are loaded and prior to shipping, the shipper must determine to the extent practicable, that the tank, safety appurtenances and fittings are in proper condition for the safe transportation of the lading. Tanks with bottom discharge outlets must have their outlet caps off, or outlet cap plugs open, during the entire time tanks are being loaded. After loading, tanks with bottom outlet valves which permit more than a dropping of the liquid with the outlet caps off, or the outlet cap plugs open, must not be offered for transportation until proper repairs have been made. Tanks which show any dropping or leaking of liquid contents at seams or rivets, must not be offered for transportation until proper repairs have been made.

(2) *Loading requirements for tanks with interior heater coils.* Tank cars equipped with interior heater coils, except when coils are rendered inoperative by blocking off the inlet and outlet, must be loaded with heater coil inlet and outlet caps off during entire time tanks are being loaded and show no leakage with caps off.

(3) *Securing closures.* All closures of openings in tank cars and of their protective housings must be properly secured in place by the use of a bar, wrench, or other suitable tool. A wrench having a handle at least 36 inches long must be used to apply the outlet valve cap. Manway covers and outlet valve caps must be made tight against leakage of vapor and liquid, by use of gaskets of suitable materials, before cars are tendered to carrier for transportation. Luting materials must not be used in outlet cap or on threads of bottom outlet. All closures of openings in tank cars must be inspected to the extent practical for corrosion of or damage to the gasket seating surface and for serviceability of packing, gaskets, and hold-down bolts. All defective packing, gaskets, bolting or threaded elements must be replaced.

(4) *Inspection of safety relief devices on class DOT-106A and 110A tanks.* Safety relief devices of the frangible disc or fusible plug type used on tanks of classes DOT-106A or 110A must be inspected before each loaded trip of tank by removing at least one vent for visual inspection; if it shows signs of deterioration, all devices must be removed and inspected and those which do not meet the requirements must be renewed.

(5) A tank car is authorized for shipment of a hazardous material by water when in conformance with the requirements of Part 176 of this subchapter and the following limitations:

(i) On carfloats or trainships if the material is permitted aboard a cargo vessel by § 172.101 of this subchapter, or

(ii) On railroad car ferry vessels if the material is permitted aboard a passenger vessel by § 172.101 of this subchapter.

(c) *Periodic retest and reinspection of single-unit tank car tanks.* (1) Tanks, interior heater systems, and safety relief valves must be retested periodically as specified in Retest Table 1 of this section. Retests may be made at any time during the calendar year the retest falls due except as provided in the notes. Periodic retest of exterior heater systems is not a specification requirement.

(2) Each tank must be retested by completely filling the tank and manway nozzle or expansion dome with water or other liquid of similar viscosity except as otherwise provided for in Note (d) to Retest Table 1 and applying the specified pressure for 10 minutes if the tank is not insulated, or 20 minutes if the tank is insulated. There shall be no leakage or evidence of distress. The tank insulation and jacket need not be removed unless leakage is indicated by a drop in pressure. The liquid temperature must not exceed 100° F. during the test. Caulking of welded joints to stop leaks developed during retests is prohibited.

(3) Unless longer retest interval is authorized, tanks in service 10 years or over must be internally inspected and interior heater systems inspected for defects which would make leakage or failure probable during transit.

(4) Anchor rivet housings, if used, must not be removed during retest. They shall be retested by applying an air pressure of 100 psi through openings in the tank shell and must show no leakage.

(5) Interior heater systems must be retested hydrostatically at 200 psi and must show no leakage.

(6) Safety relief valves must be retested with air or gas and must start to discharge at the pressure prescribed within plus or minus 3 percent except that if the start-to-discharge pressure is under 100 psi, the valve must start to discharge at the pressure prescribed within plus or minus 3 psi. Valves must be vapor tight at the prescribed pressure.

(7) A DOT tank car built to one specification and authorized to be stenciled to another specification must be retested in accordance with the higher specification and the test pressure stenciled accordingly on the tank

or jacket. An existing pressure tank car tank which is permanently converted to a lower pressure specification must have the new specification and conversion date permanently stamped in letters and figures at least $\frac{3}{8}$-inch high on the outside of the manway nozzle or the edge of the manway nozzle flange on the left side of the car. Each car must be tested as designated in Retests Table 1 for the new specification. On a Class DOT-111A tank car, the last numeral of the specification number may be omitted from the stamping.

(8) Retests of tanks and safety relief devices must be reported by party making tests to car owner. Reports must show initials and numbers of cars, pressure to which tested, date and place of test, and by whom tested. Reports of latest retest must be retained by owner until the next retest has been accomplished and recorded.

(9) After repairs requiring welding, riveting, caulking of rivets, or hot or cold forming to restore tank contour, tanks must be retested at the presure specified in Retest Table 1 of this paragraph before being returned to service. Glass, lead, rubber, elastomeric or polyvinyl chloride lined tanks must be retested before lining is renewed or after lining is removed. Interior heater systems must be retested before the tank is returned to service after repairs or renewals of any part of the system.

(10) The year of a pressure test, the pressure to which it was tested, and tests due dates for the tank, pressure relief valve and interior heating system must be stenciled on the tank (or on the tank jacket if the tank is insulated). If a retest is required during a particular calendar month, the month and the year must be stenciled. On existing cars, the test due date stencil must be applied at the next test date or tank painting whichever comes first. Any pressure relief valve from a stock which has been tested within six months of installation may be considered as having been tested or retested in the month in which installed, providing the valve has been protected from deterioration during this period.

(11) Any glass, rubber, or lead-lined tank need not be periodically retested, but the interior heater systems and safety valves must be retested at the prescribed interval. See also paragraph (c)(9) of this section.

(12) Any tank lined with an elastomeric polyvinyl chloride at least $\frac{3}{32}$-inch thick or an elastomeric polyurethane at least $\frac{1}{16}$-inch thick need not be periodically retested, but the heater system and safety relief valves must be retested at the prescribed intervals. The tank must be retested before lining is renewed.

(13) *Special requirements for Class DOT-113 tank cars.* (i) A Class DOT-113 tank car need not be periodically pressure tested; however, each shipment must be monitored to determine the average daily pressure rise in the tank car. If the average daily pressure rise during any shipment exceeds 3 psi per day, the tank car must be retested for thermal integrity prior to any subsequent shipment.

(ii) Thermal integrity retest. Either of the following alternative thermal integrity retests may be used:

(A) *Pressure rise retest.* The pressure rise in the tank may not exceed 5 psi in 24 hours. When the pressure rise retest is performed, the absolute pressure in the annular space of the loaded tank car may not exceed 75 microns of mercury at the beginning of the retest, and may not increase more than 25 microns during the 24 hour period; or

(B) *Calculated heat transfer rate retest.* The insulation system must be performance tested as prescribed in § 179.400-4 of this subchapter. When the calculated heat transfer rate retest is performed, the absolute pressure in the annular space of the loaded tank car may not exceed 75 microns of mercury at the beginning of the retest, and may not increase more than 25 microns during the 24 hour period. The calculated heat transfer rate in 24 hours may not exceed:

(*1*) 120 percent of the appropriate standard heat transfer rate specified in § 179.401-1 of this subchapter, for DOT-113A60W and DOT-113C120W tank cars;

(*2*) .1164 Btu/day/lb. of inner tank water capacity, for DOT-113A175W tank cars;

(*3*) .3272 Btu/day/lb. of inner tank water capacity, for DOT-113C60W and 113D60W tank cars; or

(*4*) .4740 Btu/day/lb. of inner tank water capacity, for DOT-113D120W tank cars.

(iii) If the car fails either of the retests prescribed in paragraph (c)(13)(ii) of this section, the car must be removed from service and may not be placed back in service until one of the applicable retests in paragraph (c)(13)(ii) of this section is successfully completed.

(iv) Each frangible disc must be replaced every 12 months and the replacement date stenciled on the car near the pressure relief valve information.

(v) An alternate pressure relief valve must be retested at the same time interval prescribed for the required pressure relief valve. The start-to-discharge pressure and vapor tight pressure requirements for the alternate pressure relief valve must be as specified in § 179.401-1 of this subchapter. The alternate pressure relief valve values specified in § 179.401-1 of this subchapter for the DOT-113C120W tank car apply to the DOT-113D120W tank car.

RETEST TABLE 1

Specification	Retest interval years [1]				Retest pressure—p.s.i.		
	Tank and interior heater systems			Safety relief valve	Tank	Safety relief valve	
	Up to 10 years	Over 10 to 22 years	Over 22 years			Start to discharge	Vapor tight
DOT-103		10	10	10	60	[c]35	28
DOT-103AL		5	5	5	60	35	28
DOT-103W		[a]20	10	10	60	[c]35	28
DOT-103ALW	10	10	10	10	60	35	28
DOT-103A		3	1	2	60	35	28
DOT-103AW [1]	[d]5	3	1	2	60	35	28
DOT-103A-ALW [a]	[d]5	3	1	([g])	60	[b]35	28
DOT-103ANW	[d]5	3	1	2	60	35	28
DOT-103B		[f]3	[f]1	None	60		
DOT-103BW	[f]5	[f]3	[f]1	None	60		
DOT-103C		3	1	([g])	60	35	28
DOT-103CW	[d]5	3	1	([g])	60	[b]35	28
DOT-103DW	[d]5	3	1	([g])	60	35	28
DOT-103EW	[d]5	3	1	([g])	60	35	28
DOT-104		10	10	10	30	[c]35	28
DOT-104A		10	10	5	100	75	
DOT-104W		[a]20	10	10	60	[c]35	28
DOT-105			[a]10	[a]5	500	[a]225	180
DOT-105A100 [a, b]		10	10	5	100	75	60
DOT-105A200ALW [a, b]	10	10	10	5	200	150	120
DOT-105A100W	10	10	10	5	100	75	60
DOT-105A200ALW	10	10	10	5	200	150	120
DOT-105A200F	10	10	10	5	200	150	120
DOT-105A200W	10	10	10	5	200	150	120
DOT-105A300 [a]		[a]10	[a]10	[a]5	300	[a]225	180
DOT-105A300ALW	10	10	10	5	300	225	180
DOT-105A300W [a, b]	10	10	10	5	300	225	180
DOT-105A400 [a]		[a]10	[a]10	[a]5	400	[i]300	240
DOT-105A400W	[a]10	[a]10	[a]10	[a]5	400	[i]300	240
DOT-105A500 [a]		[a]10	[a]10	[a]5	500	[h]375	300
DOT-105A500W	[a, f]10	[a, f]10	[a, f]10	[a, h]5	500	[h]375	300
DOT-105A600 [a]		[a]10	[a]10	[a]5	600	450	360
DOT-105A600W	[a]10	[a]10	[a]10	[a]5	600	[i]450	360
DOT-109A100ALW	10	10	10	5	100	75	60
DOT-109A200ALW	10	10	10	5	200	150	120
DOT-109A300ALW	10	10	10	5	300	225	180
DOT-109A300W	10	10	10	5	300	225	180
DOT-111A60ALW1 [a]	10	10	10	10	60	35	28
DOT-111A60ALW2 [a]	[d]5	3	1	([g])	60	35	28

RETEST TABLE 1—Continued

Specification	Retest interval years[j]				Retest pressure—p.s.i.		
	Tank and interior heater systems			Safety relief valve	Tank	Safety relief valve	
	Up to 10 years	Over 10 to 22 years	Over 22 years			Start to discharge	Vapor tight
DOT-111A60F1[q]	10	10	10	10	60	35	28
DOT-111A60W1[q]		[p]20	10	10	60	35	28
DOT-111A60W2[q]	[d]5	3	1	2	60	[c]35	28
DOT-111A60W5	[f]5	[f]3	[f]1	None	60		
DOT-111A60W7	5	3	1	(e)	60	35	28
DOT-111A100ALW1[q]	10	10	10	10	100	75	60
DOT-111A100ALW2[q]	5	3	1	(e)	100	75	60
DOT-111A100F1[q]		10	10	10	100	75	60
DOT-111A100W1[q]		[p]20	10	10	100	75	60
DOT-111A100F2[q]	5	3	1	2	100	75	60
DOT-111A100W2[q]	[d]5	3	1	2	100	75	60
DOT-111A100W3		[p]20	10	10	100	75	60
DOT-111A100W4	10	10	10	5	100	75	60
DOT-111A100W5	[f]5	[f]3	[f]1	None	100		
DOT-111A100W6	[d]5	3	1	(e)	100	75	60
DOT-112A200W	10	10	10	5	200	150	120
DOT-112A340W[m]	10	10	10	5	340	[n]255	[n]204
DOT-112A400F[m]		10	10	5	400	300	240
DOT-112A400W[m]	10	10	10	5	400	[n]300	[n]240
DOT-112A500W[m]	10	10	10	5	500	[h]375	300
DOT-113A60W	(e)	(e)	(e)	5	(e)	(e)30	(e)24
DOT-113A175W	(e)	(e)	(e)	5	(e)	(e)115	(e)92
DOT-113C60W	(e)	(e)	(e)	5	(e)	(e)45	(e)36
DOT-113C120W	(e)	(e)	(e)	5	(e)	(e)75	(e)60
DOT-113D60W	(e)	(e)	(e)	5	(e)	(e)45	(e)36
DOT-113D120W	(e)	(e)	(e)	5	(e)	(e)75	(e)60
DOT-114A340W[m]	10	10	10	5	340	[n]255	[n]204
DOT-114A400W[m]	10	10	10	5	400	[n]300	[n]240
DOT-115A60ALW	10	10	10	5	60	35	28
DOT-115A60W1	10	10	10	5	60	35	28
DOT-115A60W6	10[f]	10	10	5	60	35	28

[a] Tanks and safety relief valves in chlorine service must be retested every 2 years at any time during the calendar month the retest falls due. See § 173.314(c) Note 12.

[b] Specifications 103CW and 103A-ALW cars built prior to Aug. 31, 1956, equipped with safety relief valves set to discharge at 45 p.s.i., may be continued in service. Such valves may be set to discharge at 35 p.s.i. by installing a spring suitable for the lower pressure. Specifications 103A-ALW and 103CW tank cars used to transport anhydrous hydrazine or hydrazine solutions may have a safety relief valve having a start to discharge pressure of 45 p.s.i. with a tolerance of plus or minus 3 p.s.i. and a vapor tight pressure of 36 p.s.i.

[c] Class 103 and 104 tank cars built before January 1, 1959 and equipped with 25 psi pressure relief valves may remain in service with start-to-discharge retested at 25 psi, vapor tight at 20 psig.

[d] A commodity for which a tank is approved may be used for filling tank and dome when retesting tanks in service not over 10 years.

[e] Safety relief valve retest period is same as tank retest period.

[f] Nickel clad tanks in bromine service and any glass, rubber, lead, or elastomeric lined tank need not be periodically retested, but the interior heater systems and pressure relief valves must be retested at the prescribed interval. For testing requirements for glass, rubber or other lined tanks see paragraphs (c)(9), (c)(11), and (c)(12) of this section.

[g] If safety relief valves are used in combination with breaking pins designed to break at 225 psi, the safety relief valves must be retested and must start to discharge at 213 psi plus or minus 3 percent.

[h] If safety relief valves are used in combination with breaking pins designed to break at 375 psi, the safety relief valves must be retested and must start to discharge at 360 psi plus or minus 3 percent.

[i] Tanks and safety relief devices in hydrocyanic acid service must be retested and inspected by a written procedure filed with and approved by the Associate Director for HMR.

[j] When the retest interval changes due to the age of the tank, the new retest interval must be measured from the last retest date but in no case shall the time between retests exceed the interval specified in Table 1 for the age of the tank. The retest of a tank because of repairs may alter the normal retest schedule specified in the table.

[k] Safety relief valves in bromine service must be retested every 2 years.

[l] [Reserved]

[m] When a safety relief valve is used in combination with a breaking pin device, the breaking pin device shall be designed to fail at a pressure of 75 percent of the tank test pressure and safety relief valve shall be set for a start-to-discharge pressure of 71 percent of the tank test pressure.

[n] If the alternate safety relief valve start-to-discharge pressure setting is used, the retest pressures of the safety relief valves must be in accordance with the provisions of § 179.10[illegible]-11 of this chapter.

[o] [Reserved]

[p] Retest period for interior heater systems on cars so equipped is 10 years.

[q] Tanks must be retested at the time they are converted from existing pressure type tanks to a non-pressure specification. When tanks are converted to DOT 103A-ALW from DOT 103ALW or AAR 201A70W, the tank must be retested at the time of conversion if welding on the tank is performed. For future retests of converted tanks, the retest interval must be selected from the table based on the age of the tank computed from the date converted instead of the date built. The conversion date must be stenciled on the tank below the built date.

[f] When tanks are converted to DOT-103AW from existing DOT-103W or 103BW tanks, the tank must be retested at time of conversion if welding on the tank is performed. Lined tanks must be retested before the lining is renewed or after the lining is removed. For future retests, the retest interval must be selected from the Table as though the tank were 10 years old at time of conversion. The conversion date must be stenciled on the tank below the built date.

[g] See paragraph (c)(13) of this section for additional requirements for Class DOT-113 cars.

[h] Tanks in sodium metal service may be visually inspected at least once every 10 years instead of being retested hydrostatically. Date of the visual inspection must be stenciled on the tank near the other required markings.

[i] Tank cars stenciled 105S, 105J, 112S, 112T, 112J, 114S, 114T or 114J have the same retest requirements as 105A, 112A, or 114A, respectively.

[j] Pressure tank cars authorized for corrosive materials service must have tank and pressure relief valve retested when removed from the service and prior to return to compressed gas service.

[k] Tank cars stenciled 105S or 105J have the same retest requirements as 105A.

(d) *Periodic retest and reinspection of tanks other than single-unit tank car tanks.* (1) Tanks designed to be removed from cars for filling and emptying and tanks to spec. DOT 107A**** and their safety relief devices must be retested periodically as specified in Retest Table 2 of this paragraph. Retests may be made at any time during the calendar year the retest falls due.

(2) Each tank, except as provided in paragraph (d)(9) of this section must be subjected to the specified hydrostatic pressure and its permanent expansion determined. Pressure must be maintained for 30 seconds and as much longer as may be necessary to secure complete expansion of the tank. Pressure gauge must permit reading to an accuracy of 1 percent. Expansion gauge must permit reading of total expansion to an accuracy of 1 percent. Expansion must be recorded in cubic centimeters. Permanent volumetric expansion must not exceed 10 percent of total volumetric expansion at test pressure and tank must not leak or show evidence of distress.

(3) Each tank, except tanks to Spec. DOT 107A, must also be subjected to interior air pressure test of at least 100 psi under conditions favorable to detection of any leakage. No leaks shall appear.

(4) Safety relief valves must be retested by air or gas, must start to discharge at or below the prescribed pressure and must be vaportight at or above the prescribed pressure.

(5) Frangible discs or fusible plugs must be removed from the tank and visually inspected.

(6) Tanks must be retested as specified in Retest Table 2 of this paragraph before return to service after repairs involving welding or heat treatment.

RETEST TABLE 2

Specification	Retest interval—years		Retest pressure—p.s.i.		Safety relief valve pressure—p.s.i.	
	Tank	Safety relief devices [e]	Tank hydrostatic expansion [d]	Tank air test	Start-to-discharge	Vapor tight
DOT 27	5	2	500	100	375	300
106A500	5	2	500	100	375	300
106A500X	5	2	500	100	375	300
106A800	5	2	800	100	600	480
106A800X	5	2	800	100	600	480
106A800NCI	5	2	800	100	600	480
107A****	[a]5	[a]2	([b])	None	None	None
110A500-W	5	2	500	100	375	300
110A800-W	5	2	800	100	600	480
110A1000-W	5	2	1,000	100	750	600
BE-27	5	2	500	100	375	300

[a] If DOT 107A**** tanks are used for transportation of flammable gases, one frangible disc from each car must be burst at the interval prescribed. The sample disc must burst at a pressure not exceeding the marked test pressure of the tank and not less than 7/10 of the marked test pressure. If the sample disc does not burst within the prescribed limits, all discs on the car must be replaced.

[b] The hydrostatic expansion test pressure must at least equal the marked test pressure.

[c] [Reserved]

[d] See § 173.31(d)(9)

[e] Safety relief valves of the spring-loaded type on tanks used exclusively for fluorinated hydrocarbons and mixtures thereof which are free from corroding components may be retested every 5 years.

(7) The month and year of test, followed by a "V" if visually inspected as described in paragraph (d)(9) of this section, must be plainly and permanently stamped into the metal of one head or chime of each tank passing test; for example, 1-60 for January 1960. On DOT 107A**** tanks, the date must be stamped into the metal of the marked end; except that if all tanks mounted on a car have been tested, the date may be stamped into the metal of a plate permanently applied to the bulkhead on the "A" end of the car. Date of previous tests and all prescribed markings must be kept legible.

(8) Retests of tanks and safety relief devices must be reported by party making tests to owner of tank. Reports must show registered identifying mark and serial number, pressure to which tested, date and place of test, and by whom tested. Reports of latest retest must be retained by owner until the next retest has been accomplished and recorded.

(9) Tanks of DOT 106A and DOT 110A-W (§§ 179.300, 179.301, 179.302 of this subchapter) specifications used exclusively for transporting fluorinated hydrocarbons and mixtures thereof which are free from corroding components may be given a periodic complete internal and external visual inspection in lieu of the periodic hydrostatic retest. Visual inspections shall be made only by competent persons. Acceptance or rejection of tanks must be based upon the methods used for cylinders in CGA Pamphlet C-6, and the results must be recorded on a suitable data sheet, the completed copies of which must be kept by the owner as a permanent record. The points to be recorded and checked on these data sheets are: Date of inspection (month and year followed by a "V" to indicate visual inspection); DOT specification number; tank identification (registered symbol and serial number, date of manufacture and ownership symbol); type of protective coating (painted, etc., and statement as to need of refinishing or recoating); conditions checked (leakage, corrosion, gouges, dents or digs, broken or damaged chime or protective ring, fire, fire damage, internal condition); disposition of tank (returned to service, returned to manufacturer for repair, or scrapped).

(e) *Tank car tanks subjected to the action of fire.* (1) Tank car tanks of other than classes DOT 106A, 107A or 110A bearing evidence of damage to the metal by fire must be withdrawn from transportation service except that if the damage to the tank is local only or confined to not more than 25 percent of the tank surface, the damaged material may be replaced. See paragraph (f)(1) of this section for the procedure for handling tank car tanks with more than 25 percent of the tank surface damaged.

(2) Tank car tanks of classes DOT 106A, 107A or 110A bearing evidence of damage to the metal by fire must be withdrawn from transportation service until they have been inspected inside and outside to determine that no reduction in wall thickness has resulted, and have been heat-treated and retested. These operations must be carried out, supervised and reported as prescribed by the specifications for original heat treatment and test.

(f) *Repairs or alterations.* (1) For procedure to be followed in making repairs or alterations to all tank car tanks and securing approval therefor, see Appendix R, Association of American Railroads Specifications for Tank Cars.

(2) After alterations of tank cars or equipment therefor from original design, a certificate of compliance with the respective specification must be furnished to the car owner, to the Bureau of Explosives, and to the Secretary, Mechanical Division, Association of American Railroads.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[29 FR 18671, Dec. 29, 1964. Redesignated at 32 FR 5605, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.31, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.32 Qualification maintenance and use of portable tanks other than Specification IM portable tanks.

(a) Except as otherwise provided in this section, each portable tank used

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for the transportation of hazardous materials must conform to the requirements of the specification and regulations for the transportation of the particular commodity. Except for Specification 56 and 57 portable tanks, a manufacturer's data report of the portable tank must be procured and retained in the files of the owner during the time that such portable tank is used for such service.

(1) When a portable tank container is used as a cargo tank container, it shall comply with all the requirements prescribed for cargo tank containers. (See § 173.33)

(2) [Reserved]

(3) Each uninsulated portable tank used for the transportation of compressed gases, as defined in § 173.300, must have an exterior surface finish complying with § 178.245-1(c) of this subchapter.

(4) No portable tank or specification 106A or 110A tank containing a hazardous material may be offered for transportation aboard a passenger vessel unless:

(i) The vessel is operating under a change to its character of vessel certification as defined in § 171.8 of this subchapter; and

(ii) The material is permitted to be transported aboard a passenger vessel in § 172.101 of this subchapter.

(5) Where IM-101 and IM-102 portable tanks are prescribed, Specification 51 portable tanks otherwise conforming to the special commodity requirements of the IM Tank Table may be used.

(b) Any portable tank container constructed prior to May 15, 1950, complying with the requirements of either the A. S. M. E. Code for Unfired Pressure Vessels, 1946 Edition, or the A. P. I.-A. S. M. E. Code for Unfired Pressure Vessels, 1943 Edition, may be used for the transportation of liquefied compressed gas, provided it fulfills all the requirements of this part and specifications for the particular gas or gases to be transported therein and shall be marked "ICC Specification 51X" on the plate required by the specification, except as modified by any or all of the following:

(1) Tanks designed and constructed in accordance with Pars. U-68, U-69, or U-201 of the A. S. M. E. Code may be used. Tanks designed and constructed in accordance with Par. U-68 or U-69 may be re-rated at a working pressure 25 percent in excess of the design pressure for which the tank was originally constructed. If advantage is taken of the increased rating, the re-rated pressure shall be marked on the plate as follows:

Re-rated working pressure—psig

NOTE 1: For purposes of setting safety relief valves, pressure control valves and establishing retest pressure, and for purposes of establishing maximum and minimum design pressures, the re-rated working pressure shall be considered as the equivalent of the design pressure as defined in the specification.

(2) Loading and unloading accessories, valves, piping, fittings, safety and gauging devices, do not have to comply with the requirements for the particular location on the tank.

(3) Tanks having capacities of between 750 pounds and 1,000 pounds of water shall be considered as portable tank containers for the purposes of this part. In lieu of using safety relief valves on such containers they may be equipped with fusible plugs only when the container is filled by weight. Size, number, and location, as well as character and physical properties of fusible plugs shall be examined by the Bureau of Explosives and approved by the Director, OHMT. These containers shall be marked "DOT Specification 51S."

(4) Specification requirements as to stress-relieving and radiographing are waived.

(c) Any portable tank container of ICC Specification 50[1] fulfilling the requirements of that specification may be continued in service for transportation of a liquefied petroleum gas if it is retested every five years in accordance with the requirements of paragraphs (e)(3), (4), and (5) of this section: *Provided,* That it is in and can be maintained in safe operating condition for the transportation of that gas. In this case the container may retain its original markings.

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[1] Use of existing portable tanks authorized, but new construction not authorized.

(d) *Use of Specifications 52 and 53 tanks.* Continued use of an existing portable tank constructed to specification 52 or 53 is authorized only for a tank constructed before June 1, 1972.

(e) *Retest.* Each portable tank used for the transportation of a hazardous material must be successfully retested before further use in accordance with the following:

(1) *Schedule.* Each tank must be retested as prescribed in paragraph (e)(2) of this section, in accordance with the following schedule:

(i) Specification 51 (§ 178.245 of this subchapter): At least once every 5 years.

(ii) Specifications 52, 53, 56, and 57 (§§ 178.251, 178.252, 173.253 of this subchapter): At least once every 2 years.

(iii) Specification 60 (§ 178.255 of this subchapter): At the end of the first 4-year period after the original test; at least once every 2 years thereafter up to a total of 12 years of service; and at least once annually thereafter. Retesting is not required on a rubber-lined tank except before each relining.

(iv) Any other portable tank authorized by this part for transportation of compressed gases (including liquefied compressed gases): At least once every 5 years.

(2) *Test procedures.* Unless otherwise specified, each tank must be retested in accordance with the following test procedures:

(i) *Pressure.* Each Specification 60 tank must be retested in accordance with § 178.255-12 of this subchapter. A Specification 57 tank must be retested in accordance with § 178.253-5(b) of this subchapter. Any other tank must be tested by a minimum pressure (air or hydrostatic) of at least 2 pounds per square inch gage or at least one and one-half times the design pressure (maximum allowable working pressure, or re-rated pressure) of the tank, whichever is greater. During each air pressure test, the entire surface of all joints under pressure must be coated with or immersed in a solution of soap and water, heavy oil, or other material suitable for the purpose of detecting leaks. The pressure must be held for a period of time sufficiently long to assure detection of leaks. During the air or hydrostatic test, relief devices may be removed, but all the closure fittings must be in place and the relief device openings plugged. Lagging need not be removed from a lagged tank if it is possible to maintain the required test pressure at constant temperature with the tank disconnected from the source of pressure.

(ii) *Visual.* While under the test pressure, the tank must be visually inspected for leakage, defective fittings and welds, defective closures, significant dents, and other defects or abnormalities which indicate a potential or actual weakness that could render the tank unsafe for the transportation of a hazardous material.

(iii) *Rejection criteria.* A tank fails to meet the requirements of the pressure test if, during the test, there is permanent distortion of the tank exceeding that permitted by the applicable specification, if there is any leakage, or if any deficiencies described in paragraph (e)(2)(ii) of this section are found. Any tank that fails must be rejected and may not be used again for the transportation of a hazardous material unless the tank is adequately repaired and thereafter a successful test is conducted in accordance with the requirements of this paragraph.

(3) *Marking.* The date of the most recent periodic retest must be marked on the tank, on or near the metal certification plate. Marking must be in accordance with § 173.24.

(4) *Records.* The owner of the tank or his authorized agent must retain a written record indicating the date and results of all required tests and the name and address of the tester, until the next retest has been satisfactorily completed and recorded.

(f) *Special tanks.* Each portable tank authorized by this part including each exemption tank (other than a tank covered by paragraph (e)(1)(iv) of this section) which is not in compliance with one of the specifications listed in paragraph (e) of this section, must be tested in accordance with the procedures prescribed in paragraph (e) of this section for the type of portable tank most nearly equivalent in design and usage. A tank constructed in accordance with paragraph U-68 or U-69 of previous editions of the ASME Code, and which has not been rerated, must be hydrostatically retested at twice the design pressure instead of the one and one-half times prescribed in paragraph (e)(2)(i) of this section.

(g) *Deteriorated tanks.* Without regard to any other retest requirements, any tank that shows evidence at any time of bad dents, corroded areas, leakage, or other conditions that indicate weakness which could render the tank unsafe for the transportation of a hazardous material, must be retested as prescribed in paragraph (e)(2) of this section.

(h) *Damaged tanks.* Any tank that has been in an accident and that has been damaged to an extent that may adversely affect its product retention capability, must be retested as prescribed in paragraph (e)(2) of this section.

(i) *Unused tanks.* Any tank that has not been used to transport a hazardous material for a period of 1 year or more may not be returned to hazardous materials service until it has been tested successfully in accordance with the requirements of paragraph (e)(2) of this section.

(j) The Department may require the testing under prescribed conditions of any tank when probable cause appears for suspecting that such tank is in unsafe operating condition.

(k) The repair of tanks is authorized, provided such repairs are made under requirements prescribed in the "Code" for the original design and construction.

(1) In addition to any other provisions of the specification, no tank shall be repaired, or remodeled, as to cause leakage or cracks or likelihood of leakage or cracks, by areas of stress concentration due to shrinkage of cooling metal in welding operations, sharp fillets, reversal of stresses, or otherwise.

(2) No field welding shall be done except to non-pressure parts.

(l) The bursting strength of any piping and fittings shall be not less than four times the design pressure of the tank, and not less than four times that pressure to which, in any instance, it may be subjected in service, by the action of a pump or other device (not including safety relief valves) the action of which may be to subject certain portions of the tank piping to pressures greater than the design pressure of the tank.

(1) Pipe joints shall be threaded, welded or flanged. If threaded pipe is used, the pipe and pipe fittings must not be lighter than (Schedule 80) weight. Nonmalleable metals must not be used in the construction of valves or fittings. Where copper tubing is permitted, joints must be brazed or be of equally strong metal union type. The melting point of brazing material may not be lower than 1000°F. The method of joining tubing must not decrease the strength of the tubing such as by the cutting of threads.

(2) Fittings shall be extra heavy. Non-malleable metals shall not be employed in the construction of valves or fittings.

(3) Suitable provision shall be made in every case to allow for expansion, contraction, jarring and vibration of all pipe. Slip joints shall not be used for this purpose.

(4) Piping and fittings shall be grouped in the smallest practicable space and shall be protected from damage as required by the specification.

(5) All piping, valves and fittings on every tank shall be leakage tested with gas or air after installation and proved tight at not less than the design pressure of the tank on which they are used. In the event of replacement, all such piping, valves, or fittings so replaced shall be tested in accordance with the requirements of this section before the tank is returned to transportation service. The requirements of this section shall apply with equal force to all hose used on such tanks, except that such hose may be so tested either before or after installation on the tank.

(m) All materials of construction used in portable tank containers and their appurtenances shall not be subject to destructive attack by the contents of the tank.

(1) All parts of tanks and appurtenances for anhydrous ammonia shall be steel. No copper, silver, zinc, nor their alloys shall be permitted. Brazed joints shall not be permitted.

(n) Each outlet of portable tanks used for the transportation of liquefied compressed gases, except carbon dioxide, shall be provided with a suitable automatic excess-flow valve. These valves shall be located inside the tank or at a point outside the tank where the line enters or leaves the tank. The valve seat shall be located inside the tank or shall be located within a welded flange or its companion flange, or within a nozzle or within a coupling. The installation shall be made in such a manner as reasonably to assure that any undue strain which causes failure requiring functioning of the valve shall cause failure in such a manner that it will not impair the operation of the valve.

Exception. Safety device connections and liquid level gauging devices which are so constructed that the outward flow of tank contents shall not exceed that passed by a No. 54 drill size opening are not required to be equipped with excess-flow valves.

(1) Excess-flow valves shall close automatically at the rated flows of gas or liquid as specified by the valve manufacturer. The connections or lines on each side of the excess-flow valve, including valves, fittings, etc., shall have a greater capacity than the rated flow of the excess-flow valve.

(2) Excess-flow valves may be designed with a by-pass, not to exceed a No. 60 drill size opening, to allow equalization of pressures.

(3) Filling and discharge lines shall be provided with manually operated shut-off valves located as close to the tank as is practicable. The use of so-called "Stop-Check" valves to satisfy with one valve the requirements of this paragraph and of paragraph (n) of this section, is forbidden.

(o) Each tank for carbon dioxide and nitrous oxide shall be lagged with a suitable insulation material of such thickness that the overall thermal conductance is not more than 0.08 Btu per square foot per degree F. differential in temperature per hour. The conductance shall be determined at 60° F. Insulation material used on tanks for nitrous oxide shall be noncombustible.

(p) A refrigerating and/or heating coil or coils may be installed in tanks for carbon dioxide and nitrous oxide. Such coils must be tested externally to at least the same pressure as the test pressure of the tank. The coils must also be tested internally to at least twice the working pressure of the heating or refrigerating system to be used but in no case less than the test pressure of the tank. Such coils shall be securely anchored. The refrigerant or heating medium to be circulated through the coil or coils must be such as to cause no adverse chemical reaction with the tank or tank contents in case of leakage.

[29 FR 18671, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.32, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.32a Approval of Specification IM portable tanks.

(a) *Application for approval.* (1) An owner or manufacturer of an IM portable tank (§§ 178.270 through 178.272 of this subchapter) shall apply for approval to any approval agency designated to approve that tank in accordance with the procedures in Subpart E, Part 107 of this chapter.

(2) Each application for approval must contain the following information:

(i) Three complete copies of all engineering drawings, calculations, and test data necessary to insure that the design complies with the relevant specification.

(ii) The manufacturer's serial number that will be assigned to each portable tank.

(iii) A statement as to whether the design type has been examined by any approval agency previously and judged unacceptable. Affirmative statements must be documented with the name of the approving agency, reason for nonacceptance, and the nature of modifications made to the design type.

(b) *Action by approval agency.* The approval agency shall:

(1) Review the application for approval to determine whether it is complete and conforms with the requirements of paragraph (a) of this section. If an application is incomplete, it will be returned to the applicant and the

applicant will be informed in what respects the application is incomplete.

(2) Review all drawings and calculations to ensure that the design is in compliance with all requirements of the relevant specification. If the application is approved, one set of the approved drawings, calculations, and test data shall be returned to the applicant. The second and third (inspector's copy) sets of approved drawings, calculations, and test data shall be retained by the approval agency.

(3) Witness all tests required in § 178.270-13 of this subchapter.

(4) Ensure, through appropriate inspection that each IM portable tank is fabricated in all respects in conformance with the approved drawings, calculations, and test data; and

(5) Upon successful completion of all requirements of this subpart, the approval agency shall:

(i) Apply its name, identifying mark or identifying number, and the date upon which the approval was issued, to the metal identification plate required by § 178.270-14 of this subchapter.

(ii) Issue an approval certificate for each IM portable tank or, in the case of a series of identical tanks manufactured to a single design, for the series of IM portable tanks. The approval certificate must include all the information required to be displayed on the required metal identification plate.

(c) *Disposition of approval certificates.* A copy of each approval certificate shall be retained by the approval agency and by the owner of each IM portable tank, and a copy shall be forwarded by the approval agency to the Director, OHMT.

(d) *Denial of application for approval.* If an approval agency finds that an IM portable tank cannot be approved for any reason, it shall so notify the applicant in writing and shall provide the applicant with the reasons for which the approval is denied. An applicant aggrieved by a decision of an approval agency may appeal the decision in writing within 90 days of receipt to the Director, OHMT.

(e) [Reserved]

(f) *Approval of other existing IM portable tanks.* Portable tanks constructed on or before May 1, 1981, that have not operated under a DOT exemption must be approved in accordance with the provisions of paragraph (b) of this section.

(g) *Modifications to approved portable tanks.* (1) Prior to modification of any approved portable tank which may affect conformance to § 178.271 or § 178.272 of this subchapter, the owner or manufacturer desiring to make such modification shall inform the approval agency that issued the initial approval of the portable tank (or if unavailable another approval agency) of the nature of the modification and request approval of the modification. The owner or manufacturer shall supply the approval agency with three sets of all revised drawings, calculations, and test data relative to the intended modification.

(2) A statement as to whether the intended modification has been examined by any approval agency previously and judged unacceptable. An affirmative statement must be documented with the name of the approving agency, the reason for nonacceptance, and the nature of changes made to the modification since its original rejection.

(3) The approval agency shall review the request for modification, and if it is determined that the proposed modification is in full compliance with the relevant DOT specification the request shall be approved and the approval agency shall:

(i) Return one set of the approved revised drawings, calculations, and test data to the applicant. The second and third sets of the approved revised drawings, calculations, and test data shall be retained by the approval agency as required in § 107.404(a)(3) of this chapter.

(ii) Ensure through appropriate inspection, that all modifications conform to the revised drawings, calculations, and test data.

(iii) Determine the extent to which retesting of the modified tank is necessary based on the nature of the proposed modification, and ensure that all required retests are performed in accordance with § 178.270-13 of this subchapter.

(iv) If modification to an approved tank alters any information on the approval certificate, issue a new approval certificate for the modified tank and ensure that any necessary changes are made to the metal identification plate. A copy of each newly issued approval certificate shall be retained by the approval agency and by the owner of each portable tank.

(4) If it determined that the proposed modification is not in compliance with the relevant DOT specification, the request shall be denied. The procedures of paragraph (d) of this section apply to such denial.

(h) *Termination of Approval Certificate.* (1) The Director, OHMT may terminate an approval issued under this section if he determines that:

(i) Information upon which the approval was based is fraudulent or substantially erroneous; or

(ii) Termination of the approval is necessary to adequately protect against risks to life and property.

(iii) The approval was not issued by the approval agency in good faith.

(2) Before an approval is withdrawn, the Director, OHMT gives the owner or manufacturer and the approval agency:

(i) Written notice of the facts or conduct believed to warrant the withdrawal;

(ii) Opportunity to submit oral and written evidence, and

(iii) Opportunity to demonstrate or achieve compliance with the application requirement.

(3) If the Director, OHMT determines that a certificate of approval must be withdrawn to preclude a significant and imminent adverse affect on public safety, he shall withdraw the certificate of approval issued by a designated approval agency. In such circumstances, the procedures of paragraphs (h)(2) (ii) and (iii) of this section need not be provided prior to withdrawal of the approval, but shall be provided as soon as practicable thereafter.

[Amdt. 173-144, 46 FR 9890, Jan. 29, 1981; 46 FR 24183, Apr. 30, 1981, as amended by Amdt. 173-48, 46 FR 36861, July 16, 1981; Amdt. 173-185, 50 FR 11052, Mar. 19, 1985]

§ 173.32b Periodic testing and inspection of Specification IM portable tanks.

(a) *Periodic testing*—(1) *Hydrostatic test.* Each Specification IM portable tank (§§ 178.270, 178.271 and 178.272 of this subchapter) and all piping, valves and accessories, except pressure-relief devices, shall be hydrostatically tested with water, or other liquid of similar density and viscosity, to a pressure not less than 150 percent of its maximum allowable working pressure. Testing shall be at intervals of not more than five years. While under pressure the tank shall be inspected, for leakage, distortion, or any other condition which might render the tank unsafe for service. The hydrostatic test shall be witnessed by an approval agency. Any damage or deficiency which might render the portable tank unsafe for service shall be repaired to the satisfaction of the witnessing approval agency and the tank hydrostatically retested. Upon successful completion of the hydrostatic test, the witnessing approval agency shall apply its name, identifying mark or identifying number and the date of the test on the tank as described in paragraph (d) of this section.

(2) *Pressure relief valves.* Spring loaded pressure relief valves must be removed from the tank and tested at intervals of not more than two and one-half years.

(b) *Visual inspection.* Each portable tank and all piping, valves and accessories shall be visually inspected at intervals not exceeding two and one-half years. The inspection shall be conducted by an owner or his agent or by an approval agency, except that it must be conducted by an approval agency coincident with each hydrostatic test required by paragraph (a) of this section. In the case of insulated tanks, insulation need not be removed if, in the opinion of the person performing the visual inspection, external corrosion is likely to be negligible. If evidence of any unsafe condition is discovered, the portable tank may not be returned to service until such condition has been corrected to the satisfaction of the person performing the inspection. The inspection shall include the following:

(1) The tank shall be carefully inspected internally for corroded areas, dents, distortions, defects in welds, and other conditions that might render the tank unsafe for service;

(2) The piping, valves, and gaskets shall be carefully inspected for corroded areas, defects in welds, and other conditions, including leakage, that might render the tank unsafe for service;

(3) Devices for tightening manhole covers must be operative and there must be no leakage at manhole covers or gaskets.

(4) Missing or loose bolts or nuts on any flanged connection or blank flange must be replaced or tightened.

(5) All emergency devices and valves must be free from corrosion, distortion and any damage or defect that could prevent their normal operation.

(6) Required markings on the tank must be legible.

(7) Upon successful completion of the visual reinspection, the inspector shall mark the date of the visual reinspection on the tank as described in paragraph (d) of this section.

(c) *International shipments.* A portable tank that meets the definition of "container" in § 450.3(a)(3) of this title may not be offered for international transport unless the frame work, tank supports and lifting attachments fully comply with all applicable requirements of Parts 450—453 of this title.

(d) *Test date marking.* The month and year of the last hydrostatic test, the identification markings of the approval agency witnessing the test, and the date of the last visual inspection must be durably and legibly marked on or near the metal identification plate in letters not less than 3 mm (0.118 inches) high when on the metal identification plate and 32 mm (1.25 inches) high when on the tank.

(e) *Damaged or deteriorated portable tanks.* Without regard to any other test requirement, any tank that shows evidence at any time of damaged or corroded areas, leakage, or other deterioration that indicates a weakness that could render the tank unsafe for service, must be inspected and tested in accordance with the requirements of paragraphs (a) and (b) of this section prior to reuse. Pressure relief devices need not be tested or replaced unless there is reason to believe the relief devices have been affected by the damage or deterioration.

(f) *Record retention.* The owner of each portable tank or his authorized agent shall retain a written record of the date and results of all required tests, (including visual inspections), and the name and address of the person performing the test, until the next retest has been satisfactorily completed and recorded.

[Amdt. 173-144, 46 FR 9891, Jan. 29, 1981]

§ 173.32c Use of Specification IM portable tanks.

(a) No person may offer a hazardous material for transportation in an IM portable tank except as authorized by this subchapter and under conditions approved by the Director, OHMT in the IM Tank Table.

(b) Except as otherwise provided in this subpart, an IM portable tank may not be used for the transportation of a hazardous material unless it meets the requirements of this subchapter and the conditions and limitations specified in the IM Tank Table for the hazardous material.

(c) An IM portable tank for which the prescribed periodic retest or reinspection under § 173.32b of this subchapter has become due may not be filled and offered for shipment until the retest or reinspection has been successfully completed. This paragraph does not apply to any tank filled prior to the test due date.

(d) Prior to filling, each IM portable tank shall be given a complete external inspection. Any unsafe condition must be corrected prior to its use. The external inspection shall include:

(1) A visual inspection of:

(i) The shell, piping, valves and other appurtenances for corroded areas, dents, defects in welds and other defects such as missing, damaged, or leaking gaskets;

(ii) All flanged connections or blank flanges for missing or loose nuts and bolts;

(iii) All emergency devices for corrosion, distortion, or any damage or defect that could prevent their normal operation; and

(iv) All required markings on the tank for legibility.

(2) An inspection to determine that any device for tightening manhole covers is operative and adequate to prevent leakage at the manhole cover.

(e) A hazardous material may not be loaded in an IM portable tank if the part of the tank or any of its appurtenances having contact with the material during transportation would be subject to destructive attack by or a dangerous reaction with the material.

(f) A hazardous material may not be loaded in an IM portable tank unless it has pressure relief devices providing total relieving capacity meeting the requirements of § 178.270-11(d) of this subchapter.

(g) A hazardous material may not be loaded in an IM portable tank with filling or discharge connections located below the normal liquid level of the tank unless:

(1) Each filling or discharge connection located below the normal liquid level of the tank has at least two serially-mounted closures consisting of an internal discharge valve and a bolted blank flange or other suitable, liquid-tight closure on each filling or discharge connection; or

(2) When required for a hazardous material by the IM Tank Table, each filling or discharge connection located below the normal liquid level of the tank, or compartment thereof, has three serially-mounted closures consisting of an internal discharge valve capable of being closed from a location remote from the valve itself, an external valve, and a bolted blank flange or other suitable, liquid-tight closure on the outlet side of the external valve.

(h) Except during a hydrostatic test, an IM portable tank may not be subjected to a pressure greater than its maximum allowable working pressure.

(i) An IM portable tank may not be loaded to a gross weight greater than the maximum allowable gross weight specified on its identification plate.

(j) An IM portable tank or compartment thereof having a volume greater than 5,000 liters (1,900 gallons) may not be loaded to a filling density less than 80 percent by volume.

(k) The outage for an IM portable tank may not be less than 2 percent at a temperature of 122°F (50°C).

(l) Each tell-tale indicator for the space between a frangible disc and a safety relief valve mounted in series must be checked after the tank is filled and prior to transportation to ensure that the frangible disc is leak free. Any leakage through the frangible disc must be corrected prior to offering the tank for transportation. The tell-tale device must be designed to prevent the loss of any hazardous material through the device itself while the tank is in transportation.

(m) An IM portable tank containing a hazardous material may not be loaded on a highway or rail transport vehicle unless loaded entirely within the horizontal outline thereof, without overhang or projection of any part of the tank assembly.

(n) Specifications IM 101 and IM 102 portable tanks used for the transportation of flammable liquids via rail may not be fitted with nonreclosing pressure relief devices except in series with spring loaded pressure relief valves.

(o) An IM 101 tank may be used whenever an IM 102 tank is authorized provided it meets the requirements of columns (5), (6), (7) and (8) of the IM Tank Table for the material to be transported.

[Amdt. 173-144, 46 FR 9892, Jan. 29, 1981]

§ 173.32d Additions, modifications and removals of entries in the IM Tank Table.

The following requirements and conditions apply to listing of hazardous materials in the IM Tank Table (the Table):

(a) A hazardous material that is not listed or authorized in the Table may be added to the Table by the Director, OHMT.

(b) Any person may request the Director, OHMT to add a material to the Table, or to delete or modify an entry in the Table. A request should contain the information specified in the preface to the Table.

(c) The decision of the Director, OHMT to add a material to the Table, deny addition of a material to the

Table, or to delete or modify an entry in the Table, will be based on a technical analysis of available data concerning the material and analogical comparison with existing entries in the Table.

(d) Each addition of a material to the Table by the Director, OHMT has interim status until completion of his review of comments following publication in the FEDERAL REGISTER of proposed permanent addition of the material to the Table. Following consideration of all comments in response to the publication, the Director will add the material to the Table, or terminate its interim status, based on the information received.

(e) If the Director, OHMT determines that it may be necessary to remove an authorization for a material from the Table, or to modify the conditions for transportation of a material in an IM portable tank, he shall take action after subjecting the issue to public comment by publication in the FEDERAL REGISTER unless he determines that public safety requires immediate action.

(f) If the Director, OHMT denies a request for addition of a material to the Table or terminates an addition of a material under paragraphs (c) and (d) of this section, an appeal of the denial or termination may be submitted to the Administrator, Research and Special Programs Administration, within 60 days of receipt of the denial or termination. The decision of the Administrator concerning the appeal is final.

[Amdt. 173-144, 46 FR 9892, Jan. 29, 1981]

§ 173.33 Qualification, maintenance, and use of cargo tanks.

(a) *General.* Unless otherwise provided in this part, every cargo tank (or compartment) used for the transportation of hazardous materials must be an authorized packaging. Such authorized packaging shall comply with requirements as set forth in this section, in addition to those regulations applicable for the transportation of the particular material. For the purposes of this part, whenever reference is made to a Specification MC-338 insulated cargo tank, the definitions in § 178.338-1 (a) and (b) of this subchapter apply.

(1) A cargo tank is authorized for shipment of a hazardous material by vessel when in conformance with the requirements of Part 176 of this subchapter and the following limitations:

(i) On carfloats or trailerships if the material is permitted aboard a cargo vessel by § 172.101 of this subchapter, or

(ii) On passenger ferry vessels or railroad car ferry vessels if the material is permitted aboard a passenger vessel by § 172.101 of this subchapter.

(2) [Reserved]

(b) Cargo tank qualification as an authorized packaging requires compliance with the applicable Specification MC-300, MC-301, MC-302, MC-303, MC-304, MC-305, MC-306, MC-307, MC-310, MC-311, MC-312, MC-330, MC-331, or MC-338 (§ 178.340, § 178.341, § 178.342, § 178.343, § 178.337 or § 178.338 of this subchapter), this section, and the inspection, retest and marking requirements of § 177.824 of this subchapter. Any Specification MC-304 cargo tank on which construction began before September 2, 1967, may have the vents and outlets modified to comply with Specification MC-307 cargo tanks (See §§ 178.342-4 and 178.342-5).

(1) A cargo tank of the specification listed in Column 1 may be used when authorized in this part, provided the tank construction began before the date in Column 2:

Column 1	Column 2
MC-300	Sept. 2, 1967.
MC-301	June 12, 1961.
MC-302, MC-303, MC-304, MC-305, MC-310, MC-311.	Sept. 2, 1967.
MC-330	May 15, 1967.

(2) For each cargo tank conforming to and used under an exemption issued before October 1, 1984, which authorized the transportation of a cryogenic liquid in a cargo tank, the owner or operator, if not the owner, shall remove the exemption number stenciled on the cargo tank and stamp the specification plate (or a plate placed adjacent to the specification plate) "DOT

MC-338" followed by the applicable exemption number, for example, "DOT MC-338-E * * * *". (Asterisks to be replaced by the exemption number.) The owner or operator, if not the owner, of a cargo tank that is remarked in this manner shall retain on file a copy of the last exemption in effect during the period the cargo tank is in service. No modification of a cargo tank remarked under this paragraph is authorized unless made in conformance with an applicable requirement or provision of this subchapter. No new construction of such cargo tanks may be initiated after September 30, 1984.

(i) The holding time must be determined, as required in § 178.338-9 of this subchapter, on each cargo tank or on at least one cargo tank of each design. Any subsequent cargo tank manufactured to the same design, if not individually tested, must have the optional test regimen performed during the first shipment (see § 178.338-9 (b) and (c) of this subchapter). For the purpose of performing the holding time test, same design means cargo tanks having the same manufacturer, same drawings, same dimensions (of length, diameter, and volume), same materials of construction, and the same insulation system.

(ii) The holding time determined by test for one authorized cryogenic liquid may be used as the basis for establishing the holding time for other authorized cryogenic liquids.

(3) For each MC-331 cargo tank (§ 178.337 of this subchapter) conforming to and used under an exemption issued before October 1, 1984, which authorized the transportation of ethane, refrigerated liquid, ethane-propane mixture, refrigerated liquid, or hydrogen chloride, refrigerated liquid, the owner or operator, if not the owner, shall remove the exemption number stenciled on the cargo tank and stamp the exemption number on the specification plate immediately after the DOT Specification, for example, "DOT MC-331-E * * * *". (Asterisks to be replaced by the exemption number.) If there is not adequate room on the specification plate, the exemption number must be stamped on a plate placed adjacent to the specification plate. The owner or operator, if not the owner, of a cargo tank that is remarked in this manner shall retain on file a copy of the last exemption in effect during the period the cargo tank is in service.

(c) Multipurpose cargo tanks. Multipurpose cargo tanks which have more than one compartment, each of which meets the requirements qualifying them as different container types, are authorized for use for applicable commodities.

(1) Multipurpose tanks which can be physically altered to qualify as containers to accommodate various commodities subject to the regulations in this part or commodities not subject to the regulation in this part are authorized if:

(i) All applicable provisions of the regulations in this part which are required to qualify the container as acceptable for the commodity being transported are met.

(ii) The required physical alterations to convert from one container type to another are clearly indicated on or near the certification plate.

(d) A Specification MC-330, MC-331 or MC-338 (§ 178.337 or § 178.338 of the subchapter) cargo tank may not be used unless it meets the following requirements, as applicable:

(1) Each cargo tank must be tested and inspected at least once every 5 years in accordance with paragraphs (d) (2), (3), (4), (10), (11) and (12) of this section.

(i) The tank, and each pressure relief valve, of any cargo tank used for the transportation of chlorine must be tested at least once every 2 years. Tanks used only in sodium metal service may have a complete internal visual inspection at least once every 5 years instead of a hydrostatic or pneumatic test.

(ii) Each cargo tank used to transport a flammable cryogenic liquid must be examined after each shipment to determine its actual holding time. The record required by § 177.840(h) of this subchapter may be used for this determination. If the examination indicates that the actual holding time of the cargo tank, after adjustment to reflect an average ambient temperature of 85° F., is less than 90 percent of the

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marked rated holding time (MRHT) for the cryogenic liquid marked on the specification plate or adjacent thereto (§ 178.338-18(b) of this subchapter), the tank may not be refilled with any flammable cryogenic liquid until it is restored to its marked rated holding time value or it is re-marked with the actual marked rated holding time determined by this examination. If the name of the flammable cryogenic liquid that was transported and its marked rated holding time is not displayed on or adjacent to the specification plate, this requirement may be met by deriving the MRHT of the cargo tank for that flammable cryogenic liquid and comparing that derived MRHT with the actual holding time after adjustment.

(2) Each tank (less fittings) must be subjected to a minimum internal pressure as shown below:

Specification	Ratio[1]
MC-330, MC-331	1½
MC-338	1¼

[1] Ratio of test pressure to the design pressure (maximum allowable working pressure or rerated pressures) of the tank.

The internal pressure may be hydraulically or pneumatically generated. If a pneumatic test is used, a suitable method must be used for detecting the existence of leaks at all joints under pressure. This method must consist either of coating the entire surface of all joints under pressure with a solution of soap and water, or using another equally sensitive method. When a pneumatic test is performed, suitable safeguards should be provided to protect employees and other persons should a failure occur.

(3) The tank shall be inspected for corroded areas, bad dents, or other conditions, including leakage under test pressure, which indicate weakness that might render the tank unsafe for transportation service, and shall be rejected if evidence of any such unsafe condition is discovered.

(4) When testing cargo tanks, the insulation and jacketing need not be removed unless it is otherwise impossible to reach test pressure and maintain a condition of pressure equilibrium after test pressure is reached, or the vacuum integrity cannot be maintained in the insulation space.

(5) [Reserved]

(6) Without regard to any other retest requirement, any tank that shows evidence at any time of bad dents, corroded areas, leakage, or other conditions that indicate weakness which might render the tank unsafe for transportation service, shall be retested as prescribed by paragraphs (d)(2), (3), and (4) of this section.

(7) Any tank which has been in an accident and which has been damaged to an extent likely to cause it to be in unsafe condition or to an extent where such a condition is suspected, shall be tested as prescribed by paragraphs (d)(2), (3), and (4) of this section.

(8) Any tank which has been out of transportation service for a period of 1 year or more shall not be returned to or placed in such service until it shall have successfully fulfilled the testing requirements prescribed by paragraphs (d)(2), (3), and (4) of this section.

(9) The Department may require the testing under prescribed conditions of any tank when probable cause appears for suspecting that such tank is in unsafe condition.

(10) *Ammonia tanks.* Each MC 330 and MC 331 cargo tank used for anhydrous ammonia which is constructed of quenched and tempered steel or constructed of other than quenched and tempered steel but without post-weld heat treatment, must be internally inspected by the wet fluorescent magnetic particle method immediately prior to and in conjunction with the performance of any hydrostatic retest prescribed in this section. The wet fluorescent magnetic particle inspection must be in accordance with Section V of the ASME Code and CGA Technical Bulletin TB-2 titled, "Guidelines for Inspection and Repair of MC 330 and MC 331 Cargo Tanks," 1975 edition. This paragraph does not apply to cargo tanks that do not have manholes.

(11) *Repairs.* All cracks and other defects found must be repaired in accordance with the repair procedures described in CGA Technical Bulletin TB-2, titled "Guidelines for Inspection

and Repair of MC 330 and MC 331 Cargo Tanks," 1975 edition and section VIII of the edition of the ASME Code under which the tank was built. Each tank having cracks and defects requiring welded repairs must meet all of the requirements of § 178.337-16 of this subchapter except that post-weld heat treatment after minor weld repairs is not required. When any repairs are made, including those by grinding, the tank must again be examined by the wet fluorescent magnetic particle method after hydrotest to assure that all defects have been removed.

(12) *Reports required.* Each motor carrier operating an MC 330 or MC 331 cargo tank subject to paragraph (d)(10) of this section must make a written report concerning the cargo tank following the required inspection or test. This reporting requirement does not apply to a motor carrier leasing a cargo tank for less than 30 days if the lessor has submitted the reports required by this section. The report for each cargo tank must contain the following:

(i) Carrier's name, address of principal office, and telephone number;

(ii) Complete name plate data required by specification MC 330 or MC 331, including data required by ASME Code;

(iii) Carrier's equipment number, which shall be the same as reported in accordance with § 177.824(f)(1)(iii) of this subchapter;

(iv) A statement indicating whether or not the tank was stress relieved after fabrication;

(v) Name and address of the person performing the test and date of test;

(vi) A statement of the nature and severity of defects found, if any. In particular, information must be furnished to indicate the location of defects detected, such as in a weld, a heat-affected zone, the liquid phase, the vapor phase, or the head-to-shell seam. If no defect or damage was discovered, that fact must be reported;

(vii) A statement indicating the methods employed to make repairs, who made the repairs, and the date they were completed. Also, a statement of whether or not the tank was stress relieved after repairs and, if so, whether full or local stress relieving was performed;

(viii) A statement of the disposition of cargo tank, such as "tank scrapped," or "returned to service;" and

(ix) A statement of whether or not the cargo tank is used for transportation of anhydrous ammonia, liquefied petroleum gas or any other commodity which shall be identified. Also, if the cargo tank was used for anhydrous ammonia, a statement indicating whether each shipment of ammonia was certified by its shipper as containing 0.2 percent water by weight.

(13) *Report retention.* A copy of the report required by this section must be retained by the carrier at its principal place of business during the period the tank is in the carrier's service and for 1 year thereafter. However, upon a written request to, and with the approval of the Director, Regional Motor Carrier Safety Office, for the region in which a motor carrier has its principal place of business, the carrier may maintain the reports at a regional or terminal office.

(14) *Supplying reports.* Each carrier offering a MC 330 or MC 331 cargo tank for sale or lease must make available for inspection a copy of any reports made under this paragraph to each prospective purchaser or lessee. Copies of such reports must be provided for the purchaser or lessee if the cargo tank is leased for more than 30 days.

(15) *Record of inspections.* Each carrier shall prepare a record of inspections required by paragraphs (d)(10), (d)(11), and (d)(12) of this section. The inspection record shall be signed by the person conducting the inspections, and retained with the carrier's file copy of the report submitted under paragraph (d)(12) of this section. The inspection record must identify by cargo tank manufacturer's serial number each cargo tank inspected and also indicate the name of the inspecting agency and person, the nature of any defect or damage discovered, and must state by what method the defect or damage was discovered If no defect or damage was discovered upon inspection this fact must also be reported.

(i) The reports required of a carrier by paragraphs (d) (12) and (13) of this section may be combined in a single report.

(e) The repair of tanks is authorized, provided such repairs are made under requirements prescribed in the "Code" for its original design and construction.

(1) In addition to any other provisions of the specification, no tank shall be repaired, or remodeled, as to cause leakage or cracks or likelihood of leakage or cracks, by areas of stress concentration due to shrinkage of cooling metal in welding operations, sharp fillets, reversal of stresses, or otherwise.

(2) No field welding shall be done except to nonpressure parts.

(f) On any tank used for a compressed gas except chlorine, the bursting pressure of all piping, pipe fittings, hose and other pressure parts except pump seals and safety relief devices must be at least 4 times the design pressure of the tank. In addition, the bursting pressure may not be less than 4 times any higher pressure to which each pipe, pipe fitting, hose and other pressure part may be subjected in service by the action of a pump or other device. For tanks used in transporting chlorine, see paragraphs (f) (8) through (10) of this section.

(1) Pipe joints shall be threaded, welded or flanged. If threaded pipe is used, the pipe and pipe fittings must not be lighter than Schedule 80 weight. Nonmalleable metals must not be used in the construction of valves or fittings. Where copper tubing is permitted, joints must be brazed or be of equally strong metal union type. The melting point of brazing material must not be lower than 1000°F. The method of joining tubing must not decrease the strength of the tubing such as by the cutting of threads.

(2) Each hose coupling must be designed for a pressure at least 20 percent in excess of the hose design pressure and so there will be no leakage when connected.

(3) Provision must be made to prevent damage to piping due to thermal expansion and contraction, jarring, and vibration. Slip joints may not be used for this purpose.

(4) Piping and fittings must be grouped in the smallest practicable space and be protected from damage as required by the specification.

(5) All piping, valves, and fittings on every tank motor vehicle shall be proved free from leaks at not less than the design pressure for the tank. This condition will be considered to have been met when such piping, valves, and fittings have been tested for leakage with gas or air after installation and proved tight at not less than the design pressure marked on the cargo tank with which they are used. In the event of replacement, all such piping, valves, or fittings so replaced shall be tested in accordance with the requirements of this section before the tank is returned to transportation service. The requirements of this section shall apply with equal force to all hose used on such tanks, except that such hose may be so tested either before or after installation on the tank.

(6) Liquid pumps or gas compressors, wherever used, must be of suitable design, adequately protected against breakage by collisions, and kept in good condition. They may be driven by motor vehicle power takeoff or other mechanical, electrical, or hydraulic means. Unless they are of the centrifugal type, they shall be equipped with suitable pressure actuated by-pass valves permitting flow from discharge to suction or to the tank.

(7) Each tank used for the shipment of carbon dioxide, refrigerated liquid or nitrous oxide, refrigerated liquid shall be provided with a suitable pressure gauge. A shutoff valve must be installed between the pressure gauge and the tank. This gauge need be used only during the filling operation.

(8) *Chlorine cargo tanks.* No piping, hose, or other means of loading or unloading may be attached to any valve of a cargo tank containing chlorine except at the time of loading or unloading. No hose, piping, or tubing used for loading or unloading may be mounted or carried on the motor vehicle. Except at the time of loading or unloading, the pipe connection of each angle valve must be closed with a screw plug which is chained or otherwise fastened to prevent misplacement.

(9) Chlorine cargo tank angle valves must be tested before installation to be leak free at not less than 225 p.s.i.g. using dry air or inert gas. The angle valves must also be tested as above once every five loadings or once a week whichever occurs first. At each loading, tanks must be inspected and the angle valves and gasketed joints must be examined and tested at a pressure of not less than 50 p.s.i.g. to determine that they are not leaking and are in proper condition for transportation. Leaks which are detected must be corrected before the cargo tank motor vehicle is shipped.

(10) Liquid chlorine pumps shall not be installed on cargo tank motor vehicles used for the shipment of chlorine.

(g) All materials of construction used in cargo tanks and their appurtenances shall not be subject to destructive attack by the contents of the tank.

(1) All parts of tanks and appurtenances for anhydrous ammonia shall be steel. No copper, silver, zinc, nor their alloys shall be permitted. Brazed joints shall not be permitted.

(h) Each outlet of cargo tanks used for the transportation of liquefied compressed gases, except carbon dioxide, refrigerated liquid shall be provided with an approved suitable automatic excess-flow valve or in lieu thereof may be fitted with an approved automatic quick-closing internal valve. These valves shall be located inside the tank or at a point outside the tank where the line enters or leaves the tank. The valve seat shall be located inside the tank or shall be located within a welded flange or its companion flange, or within a nozzle, or within a coupling. The installation shall be made in such a manner as reasonably to assure that any undue strain which causes failure requiring functioning of the valve shall cause failure in such a manner that it will not impair the operation of the valve.

EXCEPTION: Any liquid level gauging device which is constructed so that the outward flow of tank contents does not exceed that passed by a 0.060-inch diameter opening, or any safety device connection, is not required to be equipped with an excess-flow valve.

(1) Each excess-flow valve must close automatically at the rated flow of gas or liquid as specified by the valve manufacturer. The flow rating of the piping, fittings, valves, and hose on each side of the excess-flow valve must be greater than that of the excess-flow valve. If branching or any other restriction is incorporated in the system so that the flow rating is less than that of the excess-flow valve at the tank, additional excess-flow valves must be located where the flow rates are reduced.

(2) An excess-flow valve may be designed with a bypass, not to exceed 0.040-inch diameter opening, to allow equalization of pressures.

(3) Each filling and discharge line must be provided with a manual shut-off valve located as close to the tank as practicable. However, when an internal shut-off valve that closes automatically is used, a manual shut-off valve must be located in the line ahead of the hose connection. The use of a so-called "stop-check" or excess flow valve to satisfy the requirements of this rule and of paragraph (i) of this section with one valve is prohibited except as provided in § 178.337-11(c) of this subchapter.

(4) Angle valves and excess-flow valves on chlorine tank motor vehicles manufactured on or before December 31, 1974, must conform to the standards of The Chlorine Institute, Inc., as follows:

(i) An angle valve must conform to either Dwg. 104-4 dated May 5, 1958, or Dwg. 104-5, dated September 1, 1972.

(ii) An excess-flow valve conforming to either Dwg. 101-4 dated May 16, 1969, or Dwg. 101-6, dated September 1, 1973, must be installed under each liquid angle valve. An excess-flow valve conforming to either Dwg. 106-3, dated May 16, 1969, or Dwg. 106-5, dated September 1, 1973, must be installed under each gas angle valve.

(5) Angle valves and excess-flow valves on chlorine tank motor vehicles manufactured on or after January 1, 1975, must conform to the standards of The Chlorine Institute, Inc., as follows:

(i) An angle valve must conform to Dwg. 104-5, dated September 1, 1972;

(ii) An excess-flow valve conforming with Dwg. 101-6, dated September 1, 1973, must be installed under each liquid angle valve. An excess-flow valve conforming to Dwg. 106-5, dated September 1, 1973, must be installed under each gas angle valve.

(i) Each tank for chlorine, carbon dioxide, refrigerated liquid and nitrous oxide, refrigerated liquid must be insulated with a suitable insulation material of such thickness that the overall thermal conductance is not more than 0.08 B.t.u. per square foot per degree F. differential in temperature per hour. The conductance must be determined at 60° F. Insulation material used on tanks for nitrous oxide must be noncombustible. Insulation material used on tanks for chlorine must be corkboard or self-extinguishing polyurethane foam with minimum thickness of 4 inches.

(j) A refrigerating and/or heating coil or coils may be installed in tanks for carbon dioxide, refrigerated liquid and nitrous oxide, refrigerated liquid. Such coils must be tested externally to at least the same pressure as the test pressure of the tank. The coils must also be tested internally to at least twice the working pressure of the heating or refrigerating system to be used but in no case less than the test pressure of the tank. Such coils shall be securely anchored. The refrigerant or heating medium to be circulated through the coil or coils must be such as to cause no adverse chemical reaction with the tank or tank contents in case of leakage. If desired, the unit furnishing refrigeration may be mounted on the motor vehicle.

(k) Each MC 330 cargo tank used for flammable compressed gas or anhydrous ammonia must be equipped with liquid discharge controls that conform to the requirements of § 178.337-11(c) of this subchapter at each liquid discharge opening. The controls required by this paragraph must be installed not later than the date the tests prescribed by paragraph (d) of this section are required.

(49 U.S.C. 1655; 49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Order 73, 32 FR 3453, Mar. 2, 1967. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.33, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.34 Qualification, maintenance and use of cylinders.

(a) *General qualification for use of cylinders.* (See §§ 173.1 through 173.30 for requirements applying to all shipments.)

(1) No person may charge or fill a cylinder unless it is as specified in this part and Part 178 of this subchapter. A cylinder that leaks, is bulged, has defective valves or safety devices, bears evidence of physical abuse, fire or heat damage, or detrimental rusting or corrosion, must not be used unless it is properly repaired and requalified as prescribed in these regulations.

(2) When cylinders with a marked pressure limit are prescribed, other cylinders made under the same specification but with a higher marked service pressure limit are authorized. For example, cylinders marked DOT-4B500 may be used where DOT-4B300 is specified.

(b) *Grandfather clause.* A cylinder in domestic use previous to the date upon which the specification therefor was first made effective in these regulations may be used if the cylinder has been properly tested and otherwise complies with the requirements applicable for the gas with which it is charged.

(c) *Cylinder marking.* Each required marking on a cylinder must be maintained so that it is legible. Retest markings and original markings which are becoming illegible may be reproduced by stamping on a metal plate which must be permanently secured to the cylinder.

(1) Additional information not affecting the markings prescribed in the applicable cylinder specification may be placed on the cylinder. No indentation may be made in the sidewall of the cylinder unless specifically permitted in the applicable specification.

(2) When the space originally provided for dates of subsequent retests becomes filled, the stamping of additional test dates into the external surface of the footring of a cylinder is authorized.

(3) Except for marked service pressure, markings required on cylinders may not be altered or removed. The marked service pressure may be changed only upon application to the Director, Office of Hazardous Materials Transportation and receipt of written instructions as to the procedure to be followed.

(d) *Pressure relief device systems.* No person may offer a cylinder charged with a compressed gas for transportation unless the cylinder is equipped with one or more pressure relief devices sized and selected as to type, location, and quantity and tested in accordance with CGA Pamphlet S-1.1. The pressure relief device system must be capable of preventing rupture of the normally charged cylinder when subjected to a fire test conducted in accordance with CGA Pamphlet C-14, or in the case of an acetylene cylinder, CGA Pamphlet C-12. Cylinders shall not be shipped with leaking safety relief devices. Safety relief devices must be tested for leaks before the charged cylinder is shipped from the cylinder filling plant; it is expressly forbidden to repair leaking fuse plug devices, where leak is through the fusible metal or between the fusible metal and the opening in the plug body, (except by removal of the device and replacement of the fusible metal.) Exceptions are as follows:

(1) Except as provided in Notes 1, 2, and 3, safety relief devices are not required on cylinders 12 inches or less in length, exclusive of neck, and 4½ inches or less in outside diameter.

NOTE 1: Safety relief devices are required on specifications 9, 40, 41, and 39 (§ 178.65 of this subchapter) cylinders. Metal safety relief valves are required on specification 39 cylinders used for liquefied flammable gases. Fusible safety relief devices are not authorized on specification 39 cylinders containing liquefied compressed gases.

NOTE 2: Safety relief devices are required on cylinders charged with a liquefied gas for which this part requires a service pressure of 1,800 psi or higher.

NOTE 3: Safety relief devices are required on cylinders charged with nonliquefied gases to a pressure of 1,800 psi or higher at 70° F.

(2) Except for specification 39 cylinders and cylinders for acetylene in solution, safety relief devices are not required on cylinders charged with nonliquefied gas under pressure of 300 p.s.i. or less at 70° F.

(3) Safety relief devices are prohibited on cylinders charged with Poison A gas or liquid.

(4) Safety relief devices are prohibited on cylinders charged with fluorine.

(5) Safety relief devices are not required on cylinders charged with methyl mercaptan; with mono-, di-, or trimethylamine, anhydrous; with not over 10 pounds of nitrosyl chloride; or with less than 165 pounds of anhydrous ammonia.

(6) [Reserved]

(7) Safety relief devices, if used, must be in the vapor space of cylinders containing pyroforic liquids, n.o.s., covered by § 173.134.

(e) *Periodic retesting and reinspection of cylinders.* Each cylinder becomes due for periodic retest in accordance with the following table and exceptions thereto:

Specification under which cylinder was made	Minimum retest pressure (p.s.i.)	Retest period (years)
DOT-3	3,000 p.s.i.	5
DOT-3A, 3AA, 3AL	5/3 times service pressure, except noncorrosive service (see § 173.34 (e)(10))	5 or 10 (see § 173.34(e)(11), (e)(14), and (e)(15))
DOT-3AX, 3AAX	5/3 times service pressure	5
3B, 3BN	2 times service pressure (see § 173.34 (e)(10))	5 or 10 (see § 173.34(e)(14))
3C	Retest not required	
3D	5/3 times service pressure	5
3E	Retest not required	
3HT	5/3 times service pressure	3 (see § 173.34(e)(13))
3T	5/3 times service pressure	5
4	700 p.s.i.	10
4A	5/3 times service pressure (see § 173.34(e)(10))	5 or 10 (see § 173.34(e)(14))
4AA480	2 times service pressure (see § 173.34 (e)(10))	5 or 10 (see § 173.34(e)(11))
4B, 4BA, 4BW, 4B-240ET	2 times service pressure, except non-corrosive service (see § 173.34(e) (10))	5 or 10 (see § 173.34(e)(9) and (e)(14))
4C	Retest not required	

Specification under which cylinder was made	Minimum retest pressure (p.s.i.)	Retest period (years)
4D, 4DA, 4DS	2 times service pressure	5
DOT-4E	2 times service pressure, except non-corrosive service (see § 173.34(e) (10))	5
4L	Retest not required	
8, 8AL	Retest not required	
DOT-9	400 p.s.i. (maximum 600 p.s.i.)	5
25	500 p.s.i.	5
26 for filling at over 450 p.s.i.	5/3 times service pressure	5
26 for filling at 450 p.s.i. and below	2 times service pressure, except non-corrosive service (see § 173.34(e) (10))	5 or 10 (see § 173.34(e)(9))
33	800 p.s.i.	5
38	500 p.s.i.	5
Any cylinder with marked test pressure	Retest at marked test pressure	5
Foreign cylinder charged for export	As marked on the cylinder, but not less than 5/3 of any service or working pressure marking	See § 173.301(j)

NOTE 1. For cylinders not marked with a service pressure, see § 173.301(e)(1).

(1) This periodic retest must include a visual internal and external examination together with a test by interior hydrostatic pressure in a water jacket or other apparatus of suitable form for the determination of the expansion of the cylinder. Each person who represents that he performs retesting in accordance with this paragraph must have a retester's identification number issued by the RSPA or have a valid Bureau of Explosives approval issued prior to August 17, 1978. Such persons holding a B of E approval without a termination date must obtain a retester's identification number from RSPA before December 31, 1979. The internal inspection may be omitted for cylinders of the type and in the service described under paragraphs (e) (9) and (10) of this section.

(2) Cylinders of DOT 4 series, without regard to date of previous test, that show bad dents or other evidence of rough usage, or that are corroded locally to such extent as to indicate possible weakness, or that have lost as much as 5 percent of their official tare weight, must be retested before being again charged and shipped. After any retest, the actual tare weight for those cylinders passing the test may be recorded as their new official tare weight.

(3) In hydrostatic retesting of a cylinder the pressure must be maintained for at least 30 seconds and as much longer as may be necessary to secure complete expansion of the cylinder. The gauge indicating the total expansion of the cylinder must be such that the total expansion can be read with an accuracy of 1 percent, except that a reading to 0.1 cubic centimeter shall be acceptable. The gauge indicating the pressure must be capable of being read to within 1 percent of the test pressure. Any internal pressure applied previous to the test pressure shall not exceed 90 percent of the test pressure. If, due to failure of the test apparatus, the test pressure cannot be maintained, the test may be repeated at a pressure increased by 10 percent or 100 psi, whichever is the lower value.

(4) A cylinder must be condemned when it leaks, or when internal or external corrosion, denting, bulging, or evidence of rough usage exists to the extent that the cylinder is likely to be weakened appreciably, or when the permanent expansion exceeds 10 percent of the total expansion, except that for DOT 4E aluminum cylinders, when the permanent expansion exceeds 12 percent of the total expansion. Except for DOT 3AL and DOT 4E aluminum cylinders, a cylinder condemned for excessive permanent expansion may be reheat-treated. (See paragraph (g) of this section.) DOT 4 series cylinders, condemned for other than excessive permanent expansion, may be repaired and rebuilt as otherwise provided in this section.

(5) Records showing the result of reinspection and retest must be kept by the owner or his authorized agent until either expiration of the retest

period, or until the cylinder is again reinspected or retested, whichever occurs first.

(6) Each cylinder passing reinspection and retest must be marked with the date (month and year), plainly and permanently stamped into the metal of the cylinder or on a metal plate which must be permanently secured to the cylinder. For example, "4-70" for April 1970. The dash between the month and year figures may be replaced by the mark of the testing or inspecting agency. Stamping must be in accordance with marking requirements of the specification. Date of the previous tests must not be obliterated.

(7) Cylinders in chlorine or sulfur dioxide service made before April 20, 1915 must be retested at 500 psi.

(8) For cylinders of not over ten pounds water capacity which are authorized for service pressures not over 300 psi, the hydrostatic testing portion of the retest procedure may consist of application of the prescribed internal hydrostatic test pressure without the use of special apparatus and without the determination of total and permanent expansions. In this test the cylinders shall be examined while under pressure and must show no leak or other harmful defect as enumerated in paragraph (e)(4) of this section.

(9) Cylinders made in compliance with specifications DOT 4B, DOT 4BA, DOT 4BW, DOT 4E, and ICC-26-300[1] (§§ 178.50, 178.51, 178.61, 178.68 of this subchapter) which are used exclusively for anhydrous dimethylamine; anhydrous monomethylamine; anhydrous trimethylamine; methyl chloride; liquefied petroleum gas; methylacetylene-propadiene stabilized; or dichlorodifluoromethane, difluoroethane, difluoromonochloroethane, monochlorodifluoromethane, monochlorotetrafluoroethane, monochlorotrifluor- ethylene, or mixture thereof, or mixtures of one or more with trichloromonofluoromethane; and which are commercially free from corroding components and protected externally by suitable corrosion resisting coatings (such as galvanizing, painting, etc.) may be retested decennially (see Note 2) instead of quinquennially, or, as an alternative such cylinders may be subjected to an internal hydrostatic pressure equal to at least two times the marked service pressure without determination of expansions (see Note 1), but this latter type of test must be repeated quinquennially after expiration of the first 10-year period (see Note 2). When subjected to this latter test, cylinders must be carefully examined under the test pressure and removed from service if leaks or other harmful defects exist.

NOTE 1: Cylinders tested by the modified hydrostatic method shall be marked after each retest with the date of test as otherwise required but followed by the symbol S; for example, 8-57S indicating retest by the modified method in August, 1957.

NOTE 2: Until further order of the Department, the decennial retest period may be extended to a 12-year period, and the quinquennial retest period may be extended to a 7-year period after expiration of the first 12-year period.

(10) Cylinders made in compliance with the specifications listed in the table below and used exclusively in the service indicated may, in lieu of the periodic hydrostatic retest, be given a complete external visual inspection at the time such periodic retest becomes due. External visual inspection as described in CGA Pamphlet C-6 will, in addition to the following requirements prescribed herein, meet the requirements for visual inspection.

When this inspection is used in lieu of hydrostatic retesting, subsequent inspections are required 5 years after the first such inspection and periodically at 5-year intervals thereafter. Inspections shall be made only by competent persons and the results shall be recorded on a suitable data sheet, the completed copies which shall be kept in accordance with the requirements of paragraph (e)(5) of this section. The points to be recorded and checked on these data sheets are: Date of inspection (month and year); DOT specification number; cylinders identification (registered symbol and serial number, date of manufacture, and ownership symbol (if needed for adequate identification)); type cylinder protective coating (painted, etc., and statement as to need of refinishing or recoating); conditions checked (leakage, corrosion, gouges, dents or digs in shell or heads, broken or damaged footring or protective ring or fire damage); disposition of cylinders (returned to service, to cylinder manufacturer for repairs or scrapped); a cylinder which passes the inspection prescribed shall have the date recorded in the manner presently prescribed for the recording of the retest date, except that an "E" is to follow the date (month and year) indicating requalification by the external inspection method.

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[1] Use of existing cylinders authorized but new construction not authorized.

Cylinders made in compliance with—	Used exclusively for—
DOT-4, DOT-3A, DOT-3AA, DOT-3A480X, DOT-4A, DOT-4AA480	Anhydrous ammonia of at least 99.95% purity
DOT-3A, DOT-3AA, DOT-3A480X, DOT-3B, DOT-4B, DOT-4BA, DOT-4BW, ICC-26-240,[1] ICC-26-300[1]	Butadiene, inhibited, which is commercially free from corroding components
DOT-3A, DOT-3A480X, DOT-3AA, DOT-3B, DOT-4A, DOT-4AA480, DOT-4B, DOT-4BA, DOT-4BW	Cyclopropane which is commercially free from corroding components
DOT-3A, DOT-3AA, DOT-3A480X, DOT-4B, DOT-4BA, DOT-4BW, DOT-4E	Fluorinated hydrocarbons and mixtures thereof which are commercially free from corroding components
DOT-3A, DOT-3AA, DOT-3A480X, DOT-3B, DOT-4B, DOT-4BA, DOT-4BW, DOT-4E, ICC-26-240,[1] ICC-26-300[1]	Liquefied hydrocarbon gas which is commercially free from corroding components
DOT-3A, DOT-3AA, DOT-3A480X, DOT-3B, DOT-4B, DOT-4BA, DOT-4BW, DOT-4E, ICC-26-240,[1] ICC-26-300[1]	Liquefied petroleum gas which is commercially free from corroding components
DOT-3A, DOT-3AA, DOT-3B, DOT-4B, DOT-4BA, DOT-4BW, DOT-4E	Methylacetylene-propadiene, stabilized, which is commercially free from corroding components
DOT-3A, DOT-3AA, DOT-3B, DOT-4B, DOT-4BA, DOT-4BW	Anhydrous mono, di, trimethylamines which are commercially free from corroding components
DOT-4B240,DOT-4BW240	Ethylene imine, inhibited

[1] Use of existing cylinders authorized, but new construction not authorized.

(11) A cylinder made in compliance with specification DOT-3A, DOT-3A 480X, or DOT-4AA480 used exclusively for anhydrous ammonia, commercially free from corroding components, and protected externally by suitable corrosion resisting coatings (such as painting, etc.) may be retested every 10 years instead of every 5 years.

(12) All cylinders not exceeding 2 inches outside diameter and length less than 2 feet are exempted from hydrostatic retest.

(13) In addition to the requirements of this paragraph (e), cylinders marked DOT-3HT must be requalified in accordance with CGA Pamphlet C-8 and must comply with the following:

(i) Cylinders shall be subjected, at least once in three years, to a test by hydrostatic pressure in a water jacket, for the determination of the expansion of the cylinder. A cylinder must be condemned if the elastic expansion exceeds the marked rejection elastic expansion.

(ii) A cylinder must be condemned if there is evidence of any denting or bulging.

(iii) A cylinder must be condemned at the termination of a 24-year period following the date of the original test or after 4,380 pressurizations, whichever occurs first. If a cylinder is recharged more than an average of once every other day, an accurate record of the number of rechargings must be maintained by its owner, or his agent.

(iv) Retest dates shall be applied by low stress type steel stamping to a depth no greater than that of the original marking at the time of manufacture. Stamping on sidewall not authorized.

(v) A cylinder made before January 17, 1978 and not yet marked with a rejection elastic expansion (REE) in cubic centimeters near the marked original elastic expansion prior to the next retest date. The REE for a cylinder is 1.05 times its original elastic expansion.

(14) Cylinders made in compliance with specifications DOT-3A, DOT-3AA, DOT-3B, DOT-4A, DOT-4BA, and DOT-4BW (§§ 178.36, 178.37, 178.38, 178.49, 178.51, 178.61 of this chapter) having service pressures up to and including 300 p.s.i. which are

used exclusively for methyl bromide, liquid; mixtures of methyl bromide and ethylene dibromide, liquid; mixtures of methyl bromide and chlorpicrin, liquid; mixtures of methyl bromide and petroleum solvents, liquid; or methyl bromide and nonflammable, nonliquefied compressed gas mixtures, liquid; which are commercially free from corroding components, and which are protected externally by suitable corrosion resisting coatings (such as galvanizing, painting, etc.) and internally by a suitable corrosion resisting lining (galvanized, etc.) may be tested decennially instead of quinquennially. All tests must be supplemented by a visual internal and external examination of the cylinder quinquennially. Examination must be as required by CGA Pamphlet C-6. All tests must be supplemented by a very careful examination of the cylinder at each filling, and the cylinder must be rejected if evidence is found of bad dents, corroded areas, a leak, or other conditions that indicate possible weakness which would render the cylinder unfit for service.

(15) A cylinder made in compliance with specification DOT-3A or 3AA, not exceeding 125 pounds water capacity and removed from any cluster, bank, group, rack, or vehicle each time it is filled, may be retested every 10 years instead of every 5 years, provided the cylinder complies with all of the following:

(i) The cylinder is not over 35 years old when it is retested.

(ii) The cylinder is used exclusively for: Air, argon, cyclopropane, ethylene, helium, hydrogen, krypton, neon, nitrogen, nitrous oxide, oxygen, sulfur hexafluoride, xenon, and permitted mixtures thereof (see § 173.301(a)) and permitted mixtures of these gases with up to 30 percent by volume of carbon dioxide. These commodities must have a dewpoint at or below minus 52° F. at 1 atmosphere.

(iii) Prior to each refill, the cylinder is subjected to, and passes the hammer test specified in CGA Pamphlet C-6.

(iv) A cylinder currently in compliance with paragraphs (e)(15)(i), (ii), and (iii) of this section but which has not been confined to the exclusive use service specified since the last required hydrostatic retest is retested and examined in accordance with the requirements of § 173.302(c) (2), (3), and (4) before the periodic retest interval is extended to 10 years.

(v) Each cylinder less than 35 years old is stamped with a five pointed star at least one-fourth of an inch high following the test date. If at any time a cylinder marked with the star is used other than as specified in this paragraph, the star following the most recent test date is obliterated and subsequent tests are made every 5 years.

(vi) The cylinder is dried immediately following hydrostatic testing to remove all traces of free water.

(vii) The cylinder is not used for underwater breathing.

(16) A cylinder that previously contained a hazardous material classified as a "corrosive material" must not be used for the transportation of any compressed gas unless the following requirements are complied with before the subsequent initial filling with the compressed gas.

(i) The cylinder must be visually inspected, internally and externally, in accordance with the CGA Pamphlet C-6.

(ii) Regardless of the previous test or retest date, the cylinder must be tested by interior hydrostatic pressure and must meet the acceptance criteria as specified in paragraphs (e)(1), (2), (3), and (4) of this section.

(iii) In addition to the record prescribed in paragraph (e)(5) of this section, the record of the inspection and test shall include the date (month and year) of the inspection and test; the cylinder identification (including ICC or DOT specification number, registered symbol, serial number, date of manufacture, and ownership symbol); the conditions checked (leakage, corrosion, gouges, dents, or digs in shell or heads, broken or damaged footrings, or fire damage) and the disposition of the cylinder (returned to service, returned to the manufacturer for repairs, or scrapped).

(iv) A cylinder requalified for compressed gas service in accordance with this paragraph may have its next retest and inspection scheduled from the date of the inspection and retest prescribed herein.

(v) A cylinder that contained any corrosive liquid, for which decontamination methods cannot remove all significant residue or impregnation by the former corrosive content must not be used for the transportation of any compressed gas.

(f) *Cylinders subjected to the action of fire.* A cylinder which has been subjected to the action of fire must not again be placed in service until it has been properly reconditioned as follows:

(1) A cylinder made of plain carbon steel with not over 0.25 percent carbon nor over 0.90 manganese need not be reheat-treated but must pass the periodic retest requirements as specified in paragraph (e) of this section.

(2) DOT-8 cylinders made of plain carbon steel with not over 0.25 percent carbon nor over 0.90 percent manganese must be reinspected to determine the condition of the cylinder and the porous filling. If the cylinder is undamaged and the filler is unchanged and intact, the cylinder may be returned to service without reheat treatment or test.

(3) The inner cylinders made under specification DOT-4L (§ 178.57 of this chapter) may be used after again passing the original hydrostatic test.

(4) DOT 3AL and DOT 4E aluminum cylinders may not be reheat treated and must be removed from service.

(5) Other cylinders must be reheat treated and reconditioned as specified in paragraph (g) of this section.

(g) *Reheat treatment.* (1) Previous to the reheat treatment procedure hereinafter prescribed, each cylinder must be subjected to a careful internal and external inspection.

(2) Cylinders must be segregated for reheat treatment in lots of 100 or less cylinders of the same general size having practically the same chemical composition.

(3) The reheat treatment operation must be carried out, supervised, and reported as prescribed for the heat treatment in the specification covering the manufacture of the cylinder in question. Data from the original reports of manufacture of the cylinders must be available.

(4) The reheat treatment must be followed by hydrostatic retest, such retest to be carried out, supervised, and reported as prescribed for the hydrostatic tests in the specification covering the manufacture of the cylinder in question. The results of the retest must meet either of the following conditions:

(i) The permanent expansion shall be from zero to 10 percent of the total expansion in the hydrostatic retest and one cylinder from each lot shall pass the requirements of the flattening and physical tests prescribed. Failure to pass the flattening or physical tests will reject the lot or:

(ii) The permanent expansion shall not be less than 3 percent nor more than 10 percent of the total expansion in the hydrostatic retest, in which case the flattening and physical tests are not required. For this alternative method the hydrostatic retest pressure may not exceed 115 percent of the minimum prescribed test pressure except with specific approval of the Director, OHMT.

(h) *Repair by welding or brazing of specifications DOT-3A, 3AA, 3B, 3C cylinders.* Repair of specifications DOT-3A, 3AA, 3B or 3C (§§ 178.36, 178.37, 178.38, or 178.40 of this subchapter) cylinders by welding or brazing authorized, but only for the removal and replacement of neckrings and footrings attached to cylinders originally manufactured to conform to §§ 178.36-9(a), 178.37-9(a), 178.38-9(a), and 178.40-9(a) of this subchapter. Removal and replacement must be done by a regular manufacturer of this type of cylinder. After removal and before replacement of such parts, cylinders must be inspected and defective ones rejected. Cylinders, neckrings, footrings, and method of replacement must conform to § 178.36-9(a), § 178.37-9(a), § 178.38-9(a), or § 178.40-9(a) of this subchapter whichever applies. Replacement must be followed by reheat treating, testing, inspection, and supervised and reported as prescribed by the specification covering their original manufacture. Inspector's reports must conform with that required by the specification covering original manufacture with the word "repaired" substituted for "manufactured." Show original markings and the new additional markings added, and statement: "Cylinders were carefully inspected for defects after removal of neckrings and footrings and after replacement, which replacement was made by process of ———————— (Welding-brazing)."

(i) *Repair by welding or brazing of DOT-4 series and DOT-8, welded or brazed cylinders.* Repairs on DOT-4 series and DOT-8 series welded or brazed cylinders are authorized to be made by welding or brazing. Such repairs must be made by a manufacturer of these types of DOT cylinders or by a repair facility approved by the Director, OHMT and by a process similar to that used in its manufacture and under the following specific requirements:

(1) Cylinders with injurious defects in welded joints in or on pressure parts must be repaired by completely removing the defect prior to rewelding.

(2) Cylinders with injurious defects in brazed joints in or on pressure parts must be repaired by rebrazing.

(3) Cylinders during welding must be free of materials in contact with the welded joint that may impair the serviceability of the metal in or adjacent to the weld. (Precautions must be taken to prevent acetylene cylinder steels from picking up carbon during repair.)

(4) Neckrings, footrings, or other nonpressure attachments authorized by the specification may be replaced or repaired. Repair or replacement of footrings, neckrings, or other nonpressure attachments authorized by the specification for DOT-4BA and 8AL (§§ 178.51 and 178.60 of this subchapter) cylinders may be made without conforming to the requirements of paragraph (i)(6) of this section provided the following requirements are met:

(i) Must be done by a manufacturer of these types of DOT cylinders or by a repair facility approved by the Director, OHMT.

(ii) The welder shall have available to him information as to the procedure equipment, and rod used during manufacture and shall use a similar method for repair.

(iii) Repairs must be by metal arc welding only. Welds shall be 3 inches maximum length and spaced at least 3 inches apart.

(iv) Welds shall not be made on or near a brazed joint (to prevent the possibility of copper penetration).

(v) After repair the welds are to be inspected visually for weld quality.

(vi) After repair the weld area is to be leak tested at the service pressure of the cylinder.

(5) After removal, and before replacement of attachments, cylinders must be inspected and defective ones rejected, repaired or rebuilt.

(6) After repair, cylinders must be reheat-treated, tested, inspected and reported when and as prescribed by the specification covering their original manufacture when welding or brazing seams in a pressure part of a cylinder; or when welding or brazing on pressure parts of cylinders of plain carbon steels with carbon over 0.25 percent or manganese over 1.00 percent or of alloy steels except as provided in § 173.34(i)(7).

NOTE 1: Heat-treatment is not required after welding or brazing weldable low carbon parts to attachments of similar material which has been previously welded or brazed to the top or bottom of cylinders and properly heat-treated, provided such subsequent welding or brazing does not produce a temperature in excess of 400° F. in any part of the top or bottom material.

(7) Repair of cylinders must be followed by a proof pressure leakage test at prescribed test pressure and visual examination for weld quality when welding on pressure parts of cylinders of plain carbon 0.25 percent or less and manganese 1.00 percent or less, or when repairing steel types 1315, NAX and GLX by the following procedure:

(i) Leakage through the welding metal may be repaired without subsequent reheat treatment of the cylinder.

(ii) Repair permitted only by either the metal arc or tungsten inert gas shielded arc process. E7015, 7016, or 7018 electrodes not larger than ⅛ inch diameter shall be used for the metal arc process.

(iii) Weld defects must be removed by grinding or chipping before repair by the metal arc process. The tungsten inert gas shielded arc process may be used for repair only when such repair can be made by puddling. Repair weld shall not exceed 1 inch in length nor be closer than 3 inches to the next repair area.

(iv) Repair of weld defects which have any cracking is not permitted.

(j) *Repair of non-pressure attachments.* Repair of non-pressure attachments by welding or brazing without affecting a pressure part of the cylinder must be followed by visual examination for weld quality.

(k) *Prohibited repairs.* Walls, heads or bottoms of cylinders with injurious defects or leaks in base metal shall not be repaired, but may be replaced as provided for in paragraph (l) of this section.

(l) *Rebuilding of DOT-4 series and DOT-8, welded or brazed cylinders.* Rebuilding of DOT-4 series and DOT-8 series, welded or brazed cylinders is authorized. Such rebuilding must be done by a manufacturer of these types of DOT cylinders or by a repair facility approved by the Director, OHMT and by a process similar to that used in its original manufacture and under the following specific requirements:

(1) The replacement of a pressure part such as wall, heads, or bottoms of cylinders or the replacement of the porous filling material, shall be considered as rebuilding.

(2) Rebuilt cylinders shall be considered as new cylinders and shall conform to all the requirements of the specifications applying, including verification of material, examination, inspection, etc., and the rendering of the proper reports to the purchaser, cylinder rebuilder, and the Director, OHMT. Report must show that cylinders were rebuilt.

(3) Information in sufficient detail regarding previous serial numbers and identification symbols must be filed with the Director, OHMT.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[29 FR 18671, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.34, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

Subpart C—Explosives and Blasting Agents; Definitions and Preparation

SOURCE: 29 FR 18683, Dec. 29, 1964, unless otherwise noted. Redesignated at 32 FR 5606, Apr. 5, 1967.

§ 173.50 An explosive.

(a) For the purpose of Parts 170-189 of this subchapter an explosive is defined as any chemical compound, mixture, or device, the primary or common purpose of which is to function by explosion, i.e., with substantially instantaneous release of gas and heat, unless such compound, mixture, or device is otherwise specifically classified in Parts 170-189 of this subchapter.

§ 173.51 Forbidden explosives.

Unless otherwise provided in this subchapter, the transportation of the following explosives is forbidden:

(a) Explosive compounds, mixtures or devices which ignite spontaneously or undergo marked decomposition when subjected to a temperature of 167° F. (75° C.) for 48 consecutive hours.

(b) New explosive compounds, mixtures or devices except as provided for in § 173.86.

(c) Explosive mixtures or devices containing an ammonium salt and a chlorate.

(d) Explosive mixtures or devices containing an acidic metal salt and a chlorate.

(e) Leaking or damaged packages of explosives.

(f) Nitroglycerin, diethylene glycol dinitrate or other liquid explosives not authorized by §173.53(e) or (h). (For shipment by motor vehicle other than by common carrier, see § 177.822(b) of this subchapter.)

(g) Loaded firearms.

(h) Fireworks that combine an explosive and a detonator or blasting cap.

(i) Fireworks containing yellow or white phosphorous.

(j) Toy torpedoes, the maximum outside dimension of which exceeds ⅞-inch, or toy torpedoes containing a mixture of potassium chlorate, black antimony, and sulfur with an average weight of explosive composition in each torpedo exceeding four grains.

[Amdt. 173-137, 45 FR 34703, May 22, 1980]

§ 173.52 Acceptable explosives.

(a) For the purposes of this subchapter, acceptable explosives are divided into three classes as follows (acceptable military explosives must be transported on board vessels in accordance with 46 CFR 146.29):

(1) Class A explosives; detonating or otherwise of maximum hazard.

(2) Class B explosives; flammable hazard.

(3) Class C explosives; minimum hazard.

[29 FR 18683, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16064, Apr. 15, 1976]

CLASS A EXPLOSIVES; DEFINITIONS

§ 173.53 Definition of Class A explosives.

(a) *Type 1.* Solid explosives which can be caused to deflagrate by contact with sparks or flame such as produced by safety fuse or an electric squib, but cannot be detonated (see Note 1) by means of a No. 8 test blasting cap (see Note 2). Example: Black powder and low explosives.

(b) *Type 2.* Solid explosives which contain a liquid explosive ingredient, and which, when unconfined (see Note 3), can be detonated by means of a No. 8 test blasting cap (see Note 2); or which can be exploded in at least 50 percent of the trials in the Bureau of Explosives' Impact Apparatus (see Note 4) under a drop of 4 inches or more, but cannot be exploded in more than 50 percent of the trials under a drop of less than 4 inches. Example: High explosives, commercial dynamite containing a liquid explosive ingredient.

(c) *Type 3.* Solid explosives which contain no liquid explosive ingredient and which can be detonated, when unconfined (see Note 3), by means of a No. 8 test blasting cap (see Note 2); or which can be exploded in at least 50 percent of the trials in the Bureau of Explosives' Impact Apparatus (see Note 4) under a drop of 4 inches or more, but cannot be exploded in more than 50 percent of the trials under a drop of less than 4 inches. Example: High explosives, commercial dynamite containing no liquid explosive ingredient, trinitrotoluene, amatol, tetryl, picric acid, urea nitrate, pentolite, and commercial boosters.

(d) *Type 4.* Solid explosives which can be caused to detonate when unconfined (see Note 3), by contact with sparks or flame such as produced by safety fuse or an electric squib; or which can be exploded in the Bureau of Explosives' Impact Apparatus (see Note 4), in more than 50 percent of the trials under a drop of less than 4 inches. Example: Initiating and priming explosives, lead azide, fulminate of mercury, etc., and high explosives.

(e) *Type 5.* Desensitized liquid explosives are explosives which may be detonated separately or when absorbed in sterile absorbent cotton, by a No. 8 test blasting cap (see Note 2); but which cannot be exploded in the Bureau of Explosives' Impact Apparatus (see Note 4), by a drop of less than 10 inches. The desensitizer must not be significantly more volatile than nitroglycerine and the desensitized explosive must not freeze at temperatures above minus 10° F. Example: High explosives, desensitized nitroglycerine.

(f) *Type 6.* Liquid explosives that can be exploded in the Bureau of Explosives' Impact Apparatus (see Note 4) under a drop of less than 10 inches. Example: Nitroglycerin. (See § 173.51(a)(3).)

(g) *Type 7.* An initiating device is a metal or plastic casing containing initiating or priming explosives, Class A-Type 4, either with or without other explosives. It is activated by any one of several means, including an electrical pulse, a flame, a shock or detonation wave, mechanical impact (percussion) pressurized gas, or high intensity light beam. It produces an explosive output that may be used to initiate another explosive or to perform work. A time delay may be incorporated in the means of applying the stimulus, or in the initiating device itself.

(1) A detonator (see Note 5) is an initiating device (other than one properly described as a detonating fuze) which contains no more than 10 grams of total explosives weight, excluding ignition and delay charges per unit.

There are different kinds of detonators including the following:

(i) Blasting caps which are activated by safety fuse.

(ii) Blasting caps which are percussion activated.

(iii) Blasting caps which are activated by flexible detonating cord, including:

(A) Delay connectors in plastic sheaths which consist of a plastic sleeve that contains a suitable delay system with receptor and donor explosive charges in the center portion. Each end of the sleeve is made so that flexible detonating cord can be inserted into and locked to the connector;

(B) Delay connectors in metal tubes which consist of a system with a receptor and donor charge positioned between two detonators with the entire assembly placed in a metal tube having both ends open for the insertion of flexible detonating cord;

(C) Delay connectors with detonating cord pigtails which consist of delay connectors as described in paragraph (g)(1)(iii)(B) of this section that have short lenghts of detonating cord inserted into both ends and crimped in place; and

(D) Nonelectric instantaneous and delay caps which consist of blasting caps to which is assembled a length of detonating cord that may have a transfer explosive charge at the opposite end.

(iv) Blasting caps which are activated by gas pressurization or reaction.

(v) Blasting caps which are activated by a shock tube.

(vi) Electric blasting caps which are activated by an electric current.

(2) A detonating primer (see Note 6) is an initiation device for commercial use which contains more than 10 grams of total explosives weight, excluding ignition and delay charges per unit.

(3) Detonating fuzes, class A, are used in the military service to detonate the high explosive bursting charges of projectiles, mines, bombs, torpedoes, and grenades. In addition to a powerful detonator, they may contain several ounces of a high explosive, such as tetryl or dry nitrocellulose, all assembled in a heavy steel envelope. They may also contain a small amount of radioactive component. Those that are so made and packed that they will not cause functioning of other fuzes, explosives, or explosive devices in the same or adjacent containers are classed as class C explosives.

(h) *Type 8.* Any device or solid or liquid compound or mixture which is not specifically included in any of the above types, and which under special conditions may be so designated and examined by the Bureau of Explosives or the Bureau of Mines, U.S. Department of the Interior, and approved by the Director, OHMT. Example: Shaped charges, commercial.

(1) A shaped charge, commercial, consists of a plastic, paper, or other suitable container comprising a charge of not to exceed 8 ounces of a high explosive containing no liquid explosive ingredient and with a hollowed-out portion (cavity) lined with a rigid material. Detonators or other initiating elements may not be assembled in the device unless examined by the Bureau of Explosives and approved by the Director, OHMT.

(i) *Ammunition for cannon.* Ammunition for cannon is fixed, semi-fixed or separate loading ammunition which is fired from a cannon, mortar, gun, howitzer or recoilless rifle.

(j) *Ammunition for cannon with projectiles.* Ammunition for cannon with explosive projectiles, gas projectiles, smoke projectiles, incendiary projectiles, illuminating projectiles, or shell is fixed ammunition assembled in a unit consisting of the cartridge case containing the propelling charge and primer, and the projectiles, or shell, fuzed or unfuzed. Detonating fuzes, tracer fuzes, explosive or ignition devices, or fuze parts with explosives contained therein may not be assembled in ammunition or included in the same outside package unless shipped by or for the Department of Defense (DOD) and in accordance with established practices and procedures specified by DOD.

(k) *Explosive projectiles.* Explosive projectiles are shells, projectiles, warheads, or rocket heads, loaded with explosives or bursting charges, with or without other materials, for use in cannons, guns, tubes, mortars or other firing or launching devices.

(l) *Grenades.* Grenades, hand or rifle, are small metal or other containers designed to be thrown by hand or projected from a rifle. They are filled with an explosive or a liquid, gas, or solid material such as a toxic or tear gas or an incendiary or smoke producing material and a bursting charge. When shipped without explosives or bursting charges, see §§ 173.100(y), 173.330, 173.350, and 173.385.

(m) *Explosive bombs.* Explosive bombs are metal or other containers filled with explosives. They are used in warfare and include aeroplane bombs and depth bombs.

(n) *Explosive mines.* Explosive mines are metal or composition containers filled with a high explosive.

(o) *Explosive torpedoes.* Explosive torpedoes, such as are used in warfare, are metal devices containing a means of propulsion and a quantity of high explosives.

(p) *Rocket ammunition.* Rocket ammunition (including guided missiles) is ammunition designed for launching from a tube, launcher, rails, trough, or other launching device, in which the propellant material is a solid propellant explosive. It consists of an igniter, rocket motor, and projectile (warhead) either fuzed or unfuzed, containing high explosives or chemicals. Rocket ammunition may be shipped completely assembled or may be shipped unassembled in one outside container.

(q) *Ammunition for small arms with explosive projectiles or incendiary projectiles.* Ammunition for small arms with explosive projectiles and ammunition for small arms with incendiary projectiles is fixed ammunition of caliber 20 millimeters to be used in machine guns or cannons, and consists of a metallic cartridge case, the primer and the propelling charge, with explosive projectile or incendiary projectile with or without detonating fuze; the component parts necessary for one firing being all in one assembly. Detonating fuzes, tracer fuzes, explosive or ignition devices or fuze parts with explosives contained therein must not be assembled in ammunition or included in the same outside package unless shipped by, for or to the Departments of the Army, Navy, and Air Force of the U.S. Government or unless of a type approved by the Department.

(r) *Chemical ammunition.* Chemical ammunition used in warfare is all kinds of explosive chemical projectiles, shells, bombs, grenades, etc., loaded with toxic, tear, or other gas, smoke or incendiary agent, also such miscellaneous apparatus as cloud-gas cylinders, smoke generators, etc., that may be utilized to project chemicals.

(s) *Boosters, bursters, and supplementary charges.* Boosters and supplementary charges consist of a casing containing a high explosive and are used to increase the intensity of explosion of the detonator of a detonating fuze. Bursters consist of a casing containing a high explosive and are used to rupture a projectile or bomb to permit release of its contents.

(t) *Jet thrust units (jato), class A explosives; rocket motors, class A explosives; igniters, jet thrust (jato), class A explosives; and igniters, rocket motor, class A explosives.* (1) Jet thrust units (jato), class A explosives, are metal cylinders containing a mixture of chemicals capable of burning rapidly and producing considerable pressure. Under certain conditions the chemical fuel with which the unit is loaded may explode. Jet thrust units are designed to be ignited by an electric igniter. They are used to assist aeroplanes to take off.

(2) Rocket motor, class A explosives, is a device containing a propelling charge and consisting of one or more continuous type combustion unit(s) closed at one end (closure may be an igniter with a thrust plate) and with a nozzle(s) at the other end. (The rocket motor carries its own solid oxidizer-fuel combination.) The propelling charge consists of a mixture of chemicals and/or chemical compounds which when ignited is capable of burning rapidly and producing considerable pressure and which will sustain a detonation. Rocket motors, class A explosives, should be nonpropulsive in shipment (see paragraphs (t)(2) (i) and (ii) of this section). Rocket motors, class A explosives, are designed to be ignited by an electrically actuated device which may be an igniter, or by other means. They are used to propel and/or

provide thrust for guided missiles, rockets, or spacecraft.

(i) A rocket motor to be considered "nonpropulsive" must be capable of unrestrained burning and will not move appreciably in any direction when ignited by any means. Blast deflectors, thrust neutralizers, or other similar devices must be proven adequate by test prior to authorization for use.

(ii) Rocket motors, class A explosives may be shipped in a propulsive state only under conditions approved by the Department of Defense.

(3) Igniters, jet thrust (jato), class A explosives, and igniters, rocket motor, class A explosives, are devices consisting of an electrically operated or remotely controlled ignition element and a charge of fast-burning composition meeting the definition prescribed for Type 1 class A explosives (see paragraph (a) of this section), assembled in a unit for use in igniting the propelling charge of jet thrust units or rocket motors

(u) *Charged well casing jet perforating guns.* Charged well casing jet perforating guns are steel tubes or metallic strips into which are inserted shaped charges connected in series by primacord. Shaped charges must be of a type described in paragraph (h)(1) of this section, except that each shaped charge installed in the steel tube or metallic strip shall contain not over 4 ounces of high explosive. Charged well casing jet perforating guns must not be transported with blasting caps, electric blasting caps, or other firing devices affixed to or installed in the guns.

(v) *Type 9.* Propellant explosives, class A, are solid chemicals or solid chemical mixtures which are designed to function by rapid combustion of successive layers, generally with little or no smoke. The combustion is controlled by composition, size, and form of grain. Propellant explosives, class A, include some types of smokeless powder and some types of solid propellant explosives for jet thrust units, rockets, or other devices. Any propellant explosive is class A which detonates in any one out of five trials when tested in the packages in which it is offered for transportation. In conducting the test, one propellant container shall be surrounded by inert loaded containers of the same weight, including one inert container placed on top of the propellant container. The propellant shall be ignited by means of a commercial electric squib placed within 4 inches of the bottom of the container. The presence of a crater and absence of flame shall be considered as evidences of detonation.

(w) Detonating cord is a device consisting of a core of pentaerythrite tetranitrate, cyclotrimethylene-trinitramine or similar explosive overspun with tapes, yarns and plastics or waterproofing compounds without wire countering.

NOTE 1: The detonation test is performed by placing the sample in an open-end fiber tube which is set on the end of a lead block approximately 1½ inches in diameter and 4 inches high which, in turn, is placed on a solid base. A steel plate may be placed between the fiber tube and the lead block.

NOTE 2: A No. 8 test blasting cap is one containing two grams of a mixture of 80 percent mercury fulminate and 20 percent potassium chlorate, or a cap of equivalent strength.

NOTE 3: "Unconfined" as used in this section does not exclude the use of a paper or soft fiber tube wrapping to facilitate tests.

NOTE 4: The Bureau of Explosives Impact Apparatus is a testing device designed so that a guided 8-pound weight may be dropped from predetermined heights so as to impact specific quantities of liquid or solid materials under fixed conditions. Detailed prints may be obtained from the Bureau of Explosives, 1920 L Street, N.W., Washington, D.C. 20036

NOTE 5: See § 173.100 (gg) for criteria that determine whether a particular type of detonator can be classed as a Class C explosive.

NOTE 6: See § 173.100 (hh) for criteria that determine whether a particular type of detonating primer can be classed as a Class C explosive.

[29 FR 18683, Dec. 29, 1964, as amended by Order 72, 31 FR 6423, Apr. 28, 1966; Order 71, 31 FR 9069, July 1, 1966. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.53, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.54 Ammunition for cannon.

(a) Ammunition for cannon with explosive projectiles, gas projectiles, smoke projectiles, incendiary projectiles, illuminating projectiles, or tear gas projectiles must be packed and properly secured in strong wooden or metal containers, or in plastic containers of approved military specifications complying with § 173.7(a).

(b) Each outside package must be plainly marked "AMMUNITION FOR CANNON WITH EXPLOSIVE PROJECTILES," "AMMUNITION FOR CANNON WITH GAS PROJECTILES," "AMMUNITION FOR CANNON WITH SMOKE PROJECTILES," "AMMUNITION FOR CANNON WITH INCENDIARY PROJECTILES," "AMMUNITION FOR CANNON WITH ILLUMINATING PROJECTILES," OR "AMMUNITION FOR CANNON WITH TEAR GAS PROJECTILES, CLASS A EXPLOSIVES," as appropriate.

[Amdt. 173-110, 42 FR 57965, Nov. 7, 1977]

§ 173.55 Ammunition, nonexplosive.

(a) Nonexplosive ammunition is defined as a device which contains no explosives or other hazardous materials, such as cartridge cases, dummy or drill cartridges; empty, sand loaded or solid projectiles with or without tracers (containing not in excess of one ounce of tracer composition), empty mines, empty bombs, solid projectiles, empty torpedoes, or practice bombs. It also includes devices containing no explosives, or other hazardous materials, except installed electric squibs, primers, propellants or thermal batteries required for the activation of the device, provided that it has been proven by test that when initiated the full energy release is contained within the outside shipping container. Such ammunition is exempt from Parts 170-189 of this chapter. Rotating bands should be protected against deformation by method of packing or loading.

[29 FR 18683, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-158, 47 FR 43065, Sept. 30, 1982]

§ 173.56 Ammunition, projectiles, grenades, bombs, mines, gas mines, and torpedoes.

(a) Detonating fuzes, tracer fuzes, explosive or ignition devices, bouchons, or fuze parts with explosives contained therein, must not be assembled in explosive projectiles, grenades, explosive bombs, explosive mines, or explosive torpedoes, or included in the same outside package with them unless shipped by or for the Department of Defense (DOD) and in accordance with established practices and procedures specified by DOD.

(b) Explosive projectiles, explosive torpedoes, explosive mines, explosive bombs, or explosive grenades except as provided in paragraph (c) of this section, must be packed and properly secured in strong wooden or metal boxes.

(c) The following explosives may be shipped without being boxed when shipped by or for the Department of Defense (DOD) and in accordance with established practices and procedures specified by DOD:

(1) Explosive projectiles, explosive torpodoes, explosive mines, or explosive bombs, exceeding 90 pounds in weight, and explosive projectiles of not less than 4½ inches when palletized.

(2) Explosive projectiles less than 4½ inches when palletized.

(d) Gas projectiles, smoke projectiles, incendiary projectiles, illuminating projectiles, gas bombs, smoke bombs, incendiary bombs, gas grenades, smoke grenades, incendiary grenades, and gas mines, explosive, containing a bursting charge must be packed and properly secured in strong wooden boxes. Detonating fuzes, boosters or bursters, bouchons or ignition elements may not be assembled in these articles or included in the same package with them unless shipped by or for the Department of Defense (DOD) and in accordance with established practices and procedures specified by DOD.

(e) The gross weight of a box containing more than one projectile, mine, grenade, or bomb must not exceed 250 pounds.

(1) Explosive bombs packed more than one in shipping containers having gross weights not in excess of 1,400 pounds may be shipped by, for or to the Departments of the Army, Navy, and Air Force of the U.S. Government.

(f) Each exterior package or projectile, bomb, or mine must be plainly marked "Explosive Projectile," "Explosive Torpedo," "Explosive Mine," "Explosive Bomb," "Hand Grenades," or "Rifle Grenades," as the case may be, except that each device need not be so marked when palletized and the palletized units are plainly marked and shipped as carload or truckload shipments.

(g) Bombs, projectiles, grenades, ammunition for cannon with gas projectiles, or other packagings loaded with Poison A, and an explosive charge, either boxed or unboxed (see paragraph (c) of this section) must bear the POISON GAS label in addition to the EXPLOSIVE label.

(h) For regulations for shipping ammunition containing chemicals but no explosives or bursting charges, see chemical ammunition, §§ 173.330, 173.350, and 173.383.

[29 FR 18683, Dec. 29, 1964, as amended by Order 71, 31 FR 9069, July 1, 1966. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.56, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.57 Rocket ammunition.

(a) Rocket ammunition with explosive projectiles, gas projectiles, smoke projectiles, incendiary projectiles, or illuminating projectiles, must be well packed and properly secured in strong wooden, metal, preformed fiber glass resin impregnated container, or other packagings or approved military specifications which comply with § 173.7(a).

(b) Each outside package must be plainly marked "ROCKET AMMUNITION WITH EXPLOSIVE PROJECTILES," "ROCKET AMMUNITION WITH GAS PROJECTILES," "ROCKET AMMUNITION WITH SMOKE PROJECTILES," "ROCKET AMMUNITION WITH INCENDIARY PROJECTILES," or "ROCKET AMMUNITION WITH ILLUMINATING PROJECTILES," as appropriate.

[29 FR 18683, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16065, Apr. 15, 1976; Amdt. 173-138, 45 FR 32693, May 19, 1980]

§ 173.58 Ammunition for small arms.

(a) Ammunition for small arms with explosive projectiles or incendiary projectiles must be well packed and properly secured in strong metal or wooden containers. The gross weight of the outside package must not exceed 175 pounds.

(b) Each outside package must be plainly marked "AMMUNITION FOR SMALL ARMS WITH EXPLOSIVE PROJECTILES," or "AMMUNITION FOR SMALL ARMS WITH INCENDIARY PROJECTILES," as the case may be.

[Order 71, 31 FR 9069, July 1, 1966. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16065, Apr. 15, 1976]

§ 173.59 Chemical ammunition, explosive.

(a) When chemical elements of ammunition are shipped assembled with their detonating fuzes or bursting charges, they must be shipped in conformity with the regulations prescribed for explosive articles, class A, see § 173.56. For shipment of these articles not containing ignition elements, bursting charges, detonating fuzes, or other explosive components, see § 173.330, § 173.350, and § 173.383. For shipment of these articles assembled with their ignition elements or expelling charges but without any detonating or bursting charge see § 173.88(d).

[29 FR 18683, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16065, Apr. 15, 1976]

§ 173.60 Black powder and low explosives.

(a) Black powder and low explosives must be packed in containers complying with the following specifications:

(1) Specification 13 (§ 178.140 of this subchapter). Metal kegs, not less than 7 inches long. Net weight not less than 6¼ pounds nor more than 150 pounds.

(2)—(3) [Reserved]

(4) Specification 14, 15A, 16A, or 19B (§ 178.165, § 178.168, § 178.185, or § 178.191 of this subchapter). Wooden boxes with inside fiber or metal containers not over 1½ pounds capacity each, or cotton bags of at least 4 ounce cotton duck not over 25 pounds capacity each. The gross weight of Specification 14 boxes may not exceed 140

pounds and the gross weight of Specification 15A or 16A boxes may not exceed 200 pounds.

(5) Spec. 14, 15A, 16A, or 19B (§ 178.165, § 178.168, § 178.185, or § 178.191 of this subchapter). Wooden boxes with inside cylindrical fiber cartridges not over 5 inches diameter nor over 18 inches long with fiber at least 0.05 inch thick paraffined on outer surface with joints securely glued or cemented, or strong paraffined paper cartridges not over 12 inches long authorized only for compressed pellets (cylindrical block) ⅞ inch or more in diameter. Boxes must be completely lined with strong paraffined paper or other suitable waterproofed material without joints or other openings at the bottom or sides. Authorized gross weight not to exceed 75 pounds.

(6) Spec. 12H, 23F, or 23H (§ 178.209, § 178.214, or § 178.219 of this subchapter). Fiberboard boxes with inside cylindrical fiber cartridges not over 5 inches diameter nor over 18 inches long with fiber at least 0.05 inch thick paraffined on outer surface with joints securely glued or cemented, or strong paraffined paper cartridges not over 12 inches long authorized only for compressed pellets (cylindrical block) ⅞ inch or more in diameter. Authorized gross weight not to exceed 65 pounds.

(b) Black powder (not low explosives) in addition to containers specified in paragraph (a) of this section, must be shipped in containers complying with the following specifications:

(1) Spec. 14, 15A, 16A, or 19B (§ 178.165, § 178.168, § 178.185, or § 178.191 of this subchapter). Wooden boxes with inside containers which must be cloth or paper bags of capacity not exceeding 25 pounds net weight, provided the completed shipping package shall be capable of standing a drop of 4 feet without rupture of inner or outer containers. The completed package must not exceed 50 pounds, net weight of black powder.

(2) Spec. 12H, 23F, or 23H (§ 178.209, § 178.214, or § 178.219 of this subchapter). Fiberboard boxes with inside containers which must be cloth, paper, or securely closed polyethylene bags constructed of material not less than 0.004 inch thick of capacity not exceeding 25 pounds net weight for cloth or paper bags and not exceeding 50 pounds net weight for polyethylene bags, or inside fiber or metal containers having not over 1 pound capacity each, provided the completed shipping package shall be capable of withstanding a drop of 4 feet without rupture of inner or outer containers. The tubes of the box may be eliminated and a single tube as specified in spec. 23F (§ 178.214 of this subchapter) may be substituted. The completed package shall not contain more than 50 pounds net weight of black powder.

(3) Spec. 17E (§ 178.116 of this subchapter). Metal drums (single-trip), not over 5 gallons capacity each, without opening except bunghole not exceeding 2.3 inches in diameter. Authorized for carload or truckload shipments only.

(c) Black pellet powder primed with an electric squib secured inside the coaxial hole of the pellet powder with loose ends of the wires of the squib effectively short-circuited may be shipped in containers complying with the following specifications:

(1) Spec. 14, 15A, 16A, or 19B (§ 178.165, § 178.168, § 178.185, or § 178.191 of this subchapter). Wooden boxes with inside cartridges which must be strong paraffined paper cartridges not over 12 inches long authorized only for compressed pellets (cylindrical block) ⅞ inch or more in diameter. Boxes must be lined as prescribed for cylindrical fiber cartridges. Gross weight not to exceed 65 pounds.

(d) Low explosives (not black powder) may in addition to the containers specified in paragraph (a) of this section, be shipped in containers complying with the following specifications:

(1) Spec. 14, 15A, 16A, or 19B (§ 178.165, § 178.168, § 178.185, or § 178.191 of this subchapter). Wooden boxes with inside containers which must be strong paper bags of capacity not exceeding 25 pounds. Gross weight of spec. 14 box must not exceed 140 pounds. Gross weight of spec. 15A or 16A box must not exceed 200 pounds.

(2) Spec. 12H, 23F, or 23H (§ 178.209, § 178.214 or § 178.219 of this subchapter). Fiberboard boxes with inside containers which must be strong paper

bags of capacity not exceeding 25 pounds. Gross weight must not exceed 65 pounds.

(3) Spec. 15A, or 19B (§§ 178.168, 178.191 of this subchapter). Wooden boxes, lined, spec. 2L (§ 178.30 of this subchapter). Authorized only for low explosives in the form of hard nonplastic rods or cylinders not less than ⅝-inch diameter.

(e) Each outside package must be plainly marked, stamped, or stenciled "BLACK POWDER" or "LOW EXPLOSIVES," and may also show "BLASTING," "RIFLE," etc., as "BLACK BLASTING POWDER," "BLACK RIFLE POWDER," "LOW BLASTING EXPLOSIVE" or "BLACK PELLET POWDER," as the case may be.

(1) Inside containers of over 1½ pounds capacity each in boxes, must be packed with filling holes up, and the boxes must be marked on top "THIS SIDE UP."

[29 FR 18683, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16065, Apr. 15, 1976; Amdt. 173-14, 45 FR 59888, Sept. 11, 1980; Amdt. 173-149, 46 FR 49892, Oct. 8, 1981; Amdt. 173-159, 47 FR 54826, Dec. 6, 1982]

§ 173.61 High explosives.

(a) High explosives (dynamite), except gelatin dynamite, when offered for transportation by rail freight or highway must not contain in excess of 60 percent of liquid explosive ingredient and when offered for transportation by carrier by water must not contain in excess of 75 percent of liquid explosive ingredient. Maximum limit of liquid explosive ingredient specified for transportation by carrier by water applies only for such explosives as consist principally of wood pulp or other satisfactory absorbent and liquid explosive, which are comparable with good commercial dynamite under tests as to leakage of liquid ingredient and sensitiveness to the shocks of transportation, and for shipments that are otherwise in compliance with the regulations in Parts 170-189 of this subchapter, for the transportation of high explosives.

(b) High explosives consisting of a liquid mixed with an absorbent material must have the absorbent (wood pulp or similar material) in sufficient quantity and of satisfactory quality, properly dried at the time of mixing; nitrate of soda must be dried at the time of mixing to less than 1 percent of moisture; and the ingredients must be uniformly mixed so that the liquid will remain thoroughly absorbed under the most unfavorable conditions incident to transportation.

(c) High explosives containing nitroglycerin or other liquid explosive ingredients must have uniformly mixed with an absorbent material a satisfactory antacid, which must be in quantity sufficient to have the acid neutralizing power of an amount of magnesium carbonate equal to 1 percent of the nitroglycerin or other liquid explosive ingredient.

(d) Cartridges shall consist of a column of explosives completely inclosed in a shell made of strong paper or polyethylene or a combination of paper and polyethylene, so treated that it will not absorb the liquid ingredient of the explosive.

(e) Bags shall be made of strong paper or equally efficient material so treated or of such nature that it will not absorb the liquid ingredient of the explosive.

(f) All boxes in which high explosives are packed must be lined with strong paraffined paper or other suitable material, except as provided in paragraph (j) of this section, § 173.64(a)(5), and § 173.65(a)(5). Lining must be without joints or other openings or with cemented joints at the bottom, ends or sides of boxes, and for explosives with liquid ingredients must be impervious to such ingredient and also to water. Covers of boxes must be protected from contact with explosives by lining paper or other suitable material. (See spec. 2L (§ 178.30 of this subchapter), for authorized lining material.)

(g) Before cartridges or bags of gelatin explosives are packed in boxes, lined in accordance with paragraph (f) of this section, dry fine wood pulp or sawdust at least ¼ inch in depth must be spread over the bottom of box or bottom of box may have a full area pad formed of absorptive cellulose sheet having nitroglycerin absorptive value equivalent to sawdust as specified; similar materials are required in boxes for packing all non-gelatinous types of explosives containing 30 percent or more liquid explosive ingredient.

(h) Except for cartridges containing gelatin dynamite, all cartridges of high explosives exceeding 4 inches in length and containing more than 10 percent of a liquid explosive ingredient must be placed horizontally in boxes. Bags must be packed with their filling holes up.

(i) Movement of cartridges and bags of high explosives within the boxes shall be prevented by sufficiently tight packing.

(j) High explosives (dynamite), except gelatin dynamite, packed in bags or in cartridges in excess of 2 inches in diameter and containing not more than 30 percent liquid explosive ingredients may be packed in outside containers without sawdust and without lining paper provided either each inside or outside container is sift-proof and is so treated as to prevent penetration by the commodity with which the container is filled for shipping.

[29 FR 18683, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967 and amended by Amdt. 173-94, 41 FR 16065, Apr. 15, 1976]

§ 173.62 High explosives, liquid.

(a) Liquid explosives as defined in § 173.53(e) must be packed in specification containers as follows:

(1) Spec. 15L (§ 178.176 of this subchapter). Wooden boxes which must be plainly marked on top and one one side or end "HIGH EXPLOSIVES—DANGEROUS" in letters not less than 7/16 inch in height. The tops of boxes must be marked "THIS SIDE UP".

(2) Spec. 15M (§ 178.177 of this subchapter.) Wooden boxes. Metal inside containers shall contain not more than 10 quarts liquid explosives each. Boxes must be plainly marked on top and on one side or end "HIGH EXPLOSIVES—DANGEROUS" in letters not less than 7/16 inch in height. The tops of boxes must be marked "THIS SIDE UP".

(3) Spec. MC-200 (§ 178.315 of this subchapter). Motor vehicle container.

[29 FR 18683, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16065, Apr. 15, 1976]

§ 173.63 High explosive with liquid explosive ingredient.

(a) High explosives (dynamite) containing not more than 30 percent liquid explosive ingredients must be prepared as prescribed in § 173.61, except as otherwise specified, and packed in containers complying with the following specifications:

(1) Spec. 23G (§ 178.218 of this subchapter.) Fiberboard boxes. Not more than one cartridge in each box. High explosives packed in boxes consisting of more than one tube joined circumferentially are exempt from the requirements of § 173.61 (f) and (g). High explosives packed in boxes consisting of one tube closed at the ends are exempt from the requirements of § 173.61 (d), (f), and (g). Gross weight of boxes not to exceed 65 pounds.

(2) Spec. 14, 15A, 16A, or 19B (§ 178.165, § 178.168, § 178.185, or § 178.191 of this subchapter). Wooden boxes, or spec. 12H, 23F, or 23H (§ 178.209, § 178.214, or § 178.219 of this subchapter) fiberboard boxes, with inside containers which must be cartridges not exceeding 12 inches in diameter or 50 pounds in weight with length not to exceed 36 inches, or bags not exceeding 50 pounds each securely closed so as to prevent leakage therefrom. Gross weight of wooden boxes not to exceed 75 pounds and gross weight of fiberboard boxes not to exceed 65 pounds.

(3) Specification 23F or 23H (§ 178.214 or § 178.219 of this subchapter). Fiberboard boxes having one inside 26-gauge metal container, measuring not over 8 inches in diameter and 31 inches long, containing high explosives (ammonium dynamite core) surrounded by a material classed as a blasting agent. Authorized gross weight not to exceed 65 pounds.

(b) High explosives (dynamite) containing 10 percent or less of a liquid explosive ingredient in cartridges or bags as prescribed in § 173.61 (d) and (e) may be packed in wooden boxes, Specification 14, 15A, 16A, or 19B (§ 178.165, § 178.168, § 178.185, or § 178.191 of this subchapter), gross weight not to exceed 140 pounds, or fiberboard boxes, Specification 12H, 23F, or 23H (§§ 178.209, 178.214, 178.219 of this subchapter), gross weight not to exceed 65 pounds.

(1) High explosives (dynamite) containing 10 percent or less of a liquid explosive ingredient may be packed in fiberboard boxes, spec. 23G (§ 178.218 of this subchapter). Not more than one cartridge in each box. High explosives packed in boxes consisting of more than one tube joined circumferentially are exempt from the requirements of § 173.61 (f) and (g). High explosives packed in boxes consisting of one tube closed at the ends are exempt from the requirements of § 173.61 (d), (f), and (g). Gross weight of boxes not to exceed 65 pounds.

(c) High explosives (dynamite) containing more than 30 percent liquid explosive ingredients must be prepared as prescribed in § 173.61 (a) to (i), inclusive, except as otherwise specified, and in containers complying with the following specifications:

(1) Spec. 14, 15A, 16A, or 19B (§ 178.165, § 178.168, § 178.185, or § 178.191 of this subchapter) wooden boxes or spec. 12H, 23F, or 23H (§§ 178.209, 178.214, or 178.219 of this subchapter) fiberboard boxes. Inside containers must consist of:

(i) Cartridges not exceeding 4 inches in diameter and not exceeding 8 inches in length.

(ii) Cartridges exceeding 4 inches in diameter and not exceeding 5 inches in diameter and between 8 inches and not exceeding 10 inches in length must be redipped in melted paraffin or equivalent material.

(iii) Two or more cartridges that must be redipped because of their size may be enclosed in another strong paper shell to form a completed cartridge not exceeding 30 inches in length. The resulting cartridge must be dipped in melted paraffin or equivalent material.

(iv) Gross weight of wooden boxes not to exceed 75 pounds and gross weight of fiberboard boxes not to exceed 65 pounds.

(2) Spec. 14, 15A, 16A, or 19B (§ 178.165, § 178.168, § 178.185, or § 178.191 of this subchapter) wooden boxes, or spec. 12H, 23F, or 23H (§ 178.209, § 178.214, or § 178.219 of this subchapter), fiberboard boxes, with inside containers which must be paraffined two-ply paper bags not exceeding 12½ pounds capacity, securely closed by folding the tops and securing the fold by tape, with not more than two such bags inserted into another two-ply paper bag which must be securely closed and dipped in paraffin after closing, or with not more than two inside containers which must be securely closed polyethylene bags not less than 0.004 inch in thickness of not more than 12½ pounds capacity each packed in a securely closed polyethylene or paper bag and packed in polyethylene lined outside fiberboard boxes. Gross weight of wooden boxes not to exceed 75 pounds and gross weight of fiberboard boxes not to exceed 65 pounds.

(d) High explosives (gelatin dynamite and blasting gelatin) must be prepared as prescribed in § 173.61 (a) to (i) inclusive, except as otherwise specified, and in containers complying with the following specifications:

(1) Spec. 23G (§ 178.218 of this subchapter). Fiberboard boxes. Not more than one cartridge in each box. High explosives packed in boxes consisting of more than one tube joined circumferentially are exempt from the requirements of § 173.61 (f) and (g) or when packed in boxes consisting of one tube closed at the ends are exempt from the requirements of § 173.61 (d) to (g), inclusive. Gross weight of boxes not to exceed 65 pounds.

(2) Spec. 14, 15A, 16A, or 19B (§ 178.165, § 178.168, § 178.185, or § 178.191 of this subchapter). Wooden boxes, or spec. 12H, 23F, or 23H (§ 178.209, § 178.214, or § 178.219 of this subchapter), fiberboard boxes, with inside containers which must be cartridges not exceeding 12 inches in diameter or 50 pounds in weight with length not to exceed 36 inches, or bags not exceeding 12½ pounds each. Bags if not completely sealed against leakage by method of closure must be packed with filling holes up. Gross weight of wooden boxes not to exceed 75 pounds and gross weight of fiberboard boxes not to exceed 65 pounds.

(3) High explosives (gelatin dynamite or blasting gelatin) may be

shipped in a package consisting of not more than 6 cartridges of such explosives, each not exceeding 32 inches in length or 5 inches in diameter, cartridged with heavy paper in such manner as to have the approximate strength of a spec. 23G (§ 178.218 of this subchapter) container, which cartridges shall in turn be placed in a 10-ply paper tube not exceeding 11 feet in length. The outer paper tube must be equipped with a metal cone or equally efficient device on one end which shall serve to close that end of the tube and to the metal cone shall be affixed a wire threded through fiber tubes running through the center of each of the 6 cartridges; or as an alternative to the single wire running through the cartridges in the outer tube at the center, two wires may be applied, one on each side of the cartridges and between the outside of the cartridges and the inside of the outer tube. In either event, cartridges and the outer tube shall be securely closed so as to prevent spilling of any loose explosive under any conditions normally incident to transportation and cartridges shall be so loaded and stayed within the car or motor vehicle as to prevent damage to individual containers. The total gross weight of each completed package shall not exceed 125 pounds. Shipments are authorized in carload or truckload lots only without transfer of packages other than such transfers as may be necessary in the event of mechanical failure of the car or vehicle in which originally loaded.

(e) High explosives (straight gelatin dynamites of 80 percent strength and over and blasting gelatin) must be packed in cartridges or in bulk in outside boxes. When packed in bulk in boxes double lining paper throughout must be used. Containers must comply with the following specifications:

(1) Specification 14, 15A, 16A, or 19B (§§ 178.165, 178.168, 178.185, or 178.191 of this subchapter). Wooden boxes.

(2) Specification 12H, 23F, 23G, or 23H (§§ 178.209, 178.214, 178.218, 178.219 of this subchapter). Fiberboard boxes. Specification 23G must be packed in an outer container consisting of at least 7-ply heavy kraft paper (see § 173.25 for additional required marking). Two 3-mil polyethylene bags (one within the other) may be used in place of the double lining paper when Specification 12H is the outside container. Not more than one such double bag may be packed in the Specification 12H fiberboard box.

(3) Gross weight of wooden boxes not to exceed 75 pounds. Gross weight of fiberboard boxes not to exceed 65 pounds.

(f) Boxes containing high explosives must be plainly marked on top and on one side or end, except those made in compliance with spec. 23G which must be marked on the side or end, and kegs, drums, or barrels containing high explosives must be marked on both ends "HIGH EXPLOSIVES—DANGEROUS" in letters not less than 7/16 inch in height. The tops of boxes, except those made in compliance with spec. 23G, must be marked "THIS SIDE UP".

[29 FR 18683, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16065, Apr. 15, 1976; Amdt. 173-105, 42 FR 28133, June 2, 1977; Amdt. 173-141, 45 FR 62081, Sept. 18, 1980; Amdt. 173-149, 46 FR 49892, Oct. 8, 1981]

§ 173.64 High explosives with no liquid explosive ingredient and propellant explosives, Class A.

(a) High explosives containing no liquid explosive ingredients if their sensitiveness to percussion is not greater than that measured by the blow delivered by an 8-pound weight dropping from a distance of 7 inches on a compressed pellet of the explosive three-hundredths of an inch thick and two-tenths of an inch in diameter, confined rigidly between hard steel surfaces as in the standard Impact Testing Apparatus of the Bureau of Explosives, must be packed in cartridges or in bags in outside boxes. They must be packed in cartridges when their sensitiveness is greater than the limit prescribed herein. Such explosives when dry may be packed in strong sift-proof cloth or paper bags of capacity not exceeding 25 pounds. These explosives must be packed in outside containers complying with the following specifications:

(1) Specification 14, 15A, 16A, or 19B (§ 178.165, § 178.168, § 178.185, or

§ 178.191 of this subchapter). Wooden boxes.

(2) Spec. 12H, 23F, or 23H (§ 178.209, § 178.214, or § 178.219 of this subchapter). Fiberboard boxes.

(3) [Reserved]

(4) Gross weight of wooden boxes not to exceed 140 pounds. Gross weight of fiberboard boxes not to exceed 65 pounds.

(5) When such explosives contain over 5 percent moisture, box must have an inside polyethylene bag having a minimum thickness of 6 mils; or the box must be lined with strong paraffined paper or other authorized material, spec. 2L (§ 178.30 of this subchapter). Box handholes are not authorized.

(6) When such explosives are in combination cartridges, consisting of column of explosives with core of dynamite, they may be shipped when packed in outside boxes with 65 pounds as the maximum gross weight. The column of explosives must be completely inclosed in waterproofed cloth or strong waterproofed paper and must not exceed 6 inches in diameter, 20 inches in length, or gross weight of 25 pounds.

(7) Spec. 23G (§ 178.218 of this subchapter). Fiberboard boxes. Such explosives when packed in boxes consisting of more than one tube joined circumferentially are exempt from requirements of § 173.61 (f) and (g) or when packed in boxes consisting of one tube closed at the ends are exempt from requirements of § 173.61 (d) to (g) inclusive. The gross weight of boxes not to exceed 65 pounds.

(b) Boxes containing high explosives must be plainly marked on top and on one side or end, except those made in compliance with spec. 23G which must be marked on the side or end, and kegs, drums, or barrels containing high explosives must be marked on both ends "HIGH EXPLOSIVES—DANGEROUS" in letter not less than 7/16 inch in height.

(c) [Reserved]

(d) Propellant explosives, class A must be packed in containers as prescribed in § 173.93. Each outside container must be plainly marked "PROPELLANT EXPLOSIVES, CLASS A".

[29 FR 18683, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

Editorial Note: For Federal Register citations affecting § 173.64, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.65 High explosives with no liquid explosive ingredient nor any chlorate.

(a) High explosives containing no liquid explosive ingredient nor any chlorate if their sensitiveness to percussion is not greater than that measured by the blow delivered by an 8-pound weight dropping from a distance of 7 inches on a compressed pellet of the explosive three-hundredths of an inch thick and two-tenths of an inch in diameter, confined rigidly between hard steel surfaces as in the standard Impact Testing Apparatus of the Bureau of Explosives, must be packed in cartridges, or in bags or metal containers in outside boxes, except that the requirement of packaging in cartridges, bags or metal containers does not apply to plastic-bonded explosives, but they must be packed and cushioned so as to prevent movement of individual pieces within the outside shipping container. They must be packed in cartridges when their sensitiveness is greater than the limit prescribed in this section. Such explosives when dry may be packed in strong sift-proof bags securely closed so as to prevent leakage therefrom or metal containers of capacity not exceeding 60 pounds. These explosives must be packed in outside containers complying with the following specifications:

(1) Specification 14, 15A, 16A, or 19B (§§ 178.165, 178.168, 178.185, 178.191 of this subchapter). Wooden boxes.

Note 1: Wooden boxes, having inside metal containers which are tightly and securely closed, may be equipped with hand holes in each end which must be not more than one inch by four inches and centered laterally not nearer than 1¾ inches from top edge of end of box.

(2) Spec. 12H, 23F, or 23H (§ 178.209, § 178.214, or § 178.219 of this subchapter). Fiberboard boxes.

(3) Specification 17H or 37A (§§ 178.118 and 178.131 of this subchapter). Metal drums (single-trip) having a minimum 0.003-inch thick

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polyethylene liner. Authorized only for ammonium perchlorate with particle size of 5 to 15 microns. Maximum capacity is 30 gallons.

(4) Gross weight of wooden boxes not to exceed 140 pounds. Gross weight of fiberboard boxes not to exceed 65 pounds.

(5) When these explosives contain over 5 percent moisture, each box must have inside securely closed polyethylene bags having a minimum wall thickness of 0.006-inch, or must incorporate a specification 2L (§ 178.30 of this subchapter) lining. Polyethylene is authorized only for materials that will not, react with, or cause decomposition of the plastic.

(6) When such explosives are in combination cartridges, consisting of column of explosives with core of dynamite, they may be shipped when packed in outside boxes with 65 pounds as the maximum gross weight. The column of explosives must be completely inclosed in waterproofed cloth or strong waterproofed paper and must not exceed 6 inches in diameter, 20 inches in length, or gross weight of 25 pounds.

(7) Spec. 23G (§ 178.218 of this subchapter). Fiberboard boxes. Such explosives when packed in boxes consisting of more than one tube joined circumferentially are exempt from requirements of § 173.61 (f) and (g) or when packed in boxes consisting of one tube closed at the ends are exempt from requirements of § 173.61 (d) to (g) inclusive. The gross weight of boxes not to exceed 65 pounds.

(b) Amatol consisting of 80 percent ammonium nitrate and 20 percent trinitrotoluene, ammonium picrate, nitroguanidine, nitrourea, urea nitrate, picric acid, tetryl, trinitroresorcinol, trinitrotoluene, pentolite, cyclotrimethylenetrinitramine (desensitized), and soda amatol, in dry condition, in addition to containers prescribed in paragraphs (a) (1) to (5) and (7) of this section, may be shipped in containers complying with the following specifications:

(1) Specification 14, 15A, 16A, or 19B (§§ 178.165, 178.168, 178.185, 178.191 of this subchapter). Wooden boxes with inside strong paper or cloth bags not over 50 pounds capacity each, packed with filling holes up.

(2) Spec. 21C (§ 178.224 of this subchapter). Fiber drums. Net weight not to exceed 200 pounds.

(c) Trinitrotoluene and pentolite, in dry condition, in addition to containers prescribed in paragraphs (a) (1) to (5) and (b) (1) and (2) of this section, may be shipped in specification containers as follows:

(1) Specification 14, 15A, 16A, or 19B (§§ 178.165, 178.168, 178.185, 178.191 of this subchapter).Wooden boxes with inside strong paper or cloth bags not over 100 pounds capacity each, packed with filling holes up.

(2) Specification 14, 15A, 16A, or 19B (§§ 178.165, 178.168, 178.185, 178.191 of this subchapter). Wooden boxes with strong siftproof liners, Specification 2L (§ 178.30 of this subchapter).

(d) The following materials may be shipped dry as drugs, n.o.s. or medicines, n.o.s. without any other requirements by rail freight or highway if the amount in one outside package does not exceed 4 ounces, and the materials are packed in securely closed bottles or jars that are cushioned to prevent breakage:

(1) Ammonium picrate.
(2) Dipicrylamine.
(3) Dipicryl sulfide.
(4) Dinitrophenylhydrazine.
(5) Nitroguanidine.
(6) Picramide.
(7) Picric acid.
(8) Picryl chloride.
(9) Trinitroanisole.
(10) Trinitrobenzene.
(11) Trinitrobenzoic acid.
(12) Trinitro-m-cresol.
(13) Trinitronaphthalene.
(14) Trinitroresorcinol.
(15) Trinitrotoluene.
(16) Urea nitrate.
(17) Triaminotrinitrobenzene.
(18) Trichlortrinitrobenzene.
(19) Hexanitrostilbene.

(e) Ammonium picrate, cyclo- tetramethylenetetranitramine, cyclo- trimethylenetrinitramine, pentaerythrite tetranitrate (desensitized), picric acid, trinitrobenzene, trinitrobenzoic acid, trinitroresorcinol, trinitrotoluene, or urea nitrate, when wet with not less than 10 pounds of water to each 90 pounds of dry material must be shipped in packagings as follows:

(1) [Reserved]

(2) (See § 173.192 for shipments of wet ammonium picrate, wet picric acid, wet trinitrobenzoic acid, and wet urea nitrate not in excess of 16 ounces and § 173.193 for shipments of wet picric acid, wet trinitrobenzoic acid, and wet urea nitrate not in excess of 25 pounds.) (See § 173.212 for shipments of wet trinitrobenzene and wet trinitrotoluene not in excess of 16 ounces.)

(3) Specification 5B (§ 178.82 of this subchapter). Metal barrels or drums or Spec. 21C (§ 178.224 of this subchapter) fiber drums. Authorized only for cyclotetramethylenetetra- nitramine, or cyclotrimethylenetrinitra- mine, each wet with not less than 10 pounds of water to each 90 pounds of dry material in inside containers which must be bags made of at least 10-ounce cotton duck, plastic bags not less than 4 mils thick, rubber, or rubberized cloth and securely closed. The dry weight of cyclotrimethylenetrinitramine or cyclotetramethylenetetranitramine in one metal barrel or drum must not exceed 300 pounds and not more than 225 pounds in fiber drums. These bags containing the cyclotrimethylenetri- nitramine or cyclotetramethylenetri- nitramine must then be placed in a rubber bag, rubberized cloth bag, or bag made of suitable water-tight material which must be securely closed and then placed in the drum. If shipment of cyclotrimethylenetetranitramine is to take place at a time freezing weather is to be anticipated, it must be wet with a mixture of denatured ethyl alcohol or other suitable antifreeze and water of such proportions that freezing will not occur in transit.

(4) Specification 21C (§ 178.224 of this subchapter). Fiber drum with an inside polyethylene bag having 0.004 inch minimum thickness and liquid-tight closure. Net weight not to exceed 200 pounds. Authorized only for wet desensitized pentaerythrite tetranitrate.

(f) Amatol when cast or pressed in a block or column, in addition to the containers prescribed in paragraphs (a) (1) to (5) and (7) of this section, may be shipped in specification containers as follows:

(1) Spec. 13A (§ 178.141 of this subchapter). Metal drums not exceeding 90 pounds gross weight.

(g) Nitrocellulose must be packed in wooden boxes complying with Specification 14, 15A, 16A, or 19B) (§§ 178.165, 178.168, 178.185, 178.191 of this subchapter), with inside packages which must be:

(1) Inside packages containing not more than 1 pound each of dry, uncompressed nitrocellulose, wrapped in strong paraffined paper or suitable sparkproof material. Completed outside package not to contain more than 10 pounds dry nitrocellulose.

(2) Inside packages containing compressed sticks or blocks of dry nitrocellulose wrapped in strong paraffined paper. Gross weight not to exceed 75 pounds.

(h) Shaped charges, commercial, having exposed lined conical cavities must have such cavities effectively filled. Those having conical cavities that are covered shall be paired together with the cavities facing each other and with one or more pairs in a fiber tube, or so arranged that the conical cavities of the shaped charges at the ends of the column face toward the center of the tube. The shaped charges in the fiber tubes must fit snugly with no excess space and the fiber tubes containing the shaped charges must be packed snugly with no excess space in the outside containers. Other methods of packaging for devices of which shaped charges are a component part may be employed when examined by the Bureau of Explosives and approved by the Director, OHMT. Shaped charges, commercial, must be packed in specification containers as follows:

(1) Specification 14, 15A, 16A, or 19B (§§ 178.165, 178.168, 178.185, 178.191 of this subchapter). Wooden boxes. Gross weight not to exceed 140 pounds.

(2) Spec. 12H, 23F, or 23H (§ 178.209, § 178.214, or § 178.219 of this subchapter). Fiberboard boxes. Gross weight not to exceed 65 pounds.

(3) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes which must be manufactured of at least 275-pound strength (Mullen or Cady test) double-wall corrugated fiberboard and shall be provided with double-faced

corrugated lining board (see § 178.205-15 of this subchapter) having minimum strength (Mullen or Cady test) of 200 pounds. Individual charges of explosives shall be packed in inside securely closed, waterproof plastic containers, or in securely closed waterproof fiberboard containers having metal ends. Gross weight not to exceed 65 pounds. Inside individual containers shall be separated by means of double-faced corrugated fiberboard partitions of material not less than 175-pound Mullen or Cady test.

(i) Cyclotrimethylenetrinitramine (de- sensitized) in pellet form, dry, in addition to provisions of paragraphs (a) and (b) of this section may be packed in specification containers as follows:

(1) Specification 15A, or 19B (§§ 178.168, 178.191 of this subchapter). Wooden boxes. For pellets ¼ inch or less in diameter; pellets must be packed in a slide-type fiber carton with perforated fillers. All openings of the fiber carton shall be securely closed with pressure-sensitive tape. Inside containers shall be cushioned with at least 2 inches of sawdust between inner containers and outside box. No inside container shall contain more than one-half pound net weight of explosive composition and not more than 10 pounds net weight of explosive composition shall be packed in one outside box.

(2) Specification 15A, or 19B (§§ 178.168, 178.191 of this subchapter). Wooden boxes. For pellets exceeding ¼ inch in diameter; pellets must be packed in a fiber tube with positive closures at both ends, which shall be packed in a fiber carton having not more than one-half pound net weight of explosive composition. Fiber carton shall be cushioned with not less than 2 inches of sawdust in the outside box. Not more than 10 pounds net weight of explosive composition shall be packed in one outside box.

(j) Boxes containing high explosives must be plainly marked on top and on one side or end, except those made in compliance with spec. 23G (§ 178.218 of this subchapter) which must be marked on the side or end, and kegs, drums, or barrels containing high explosives must be marked on both ends "HIGH EXPLOSIVES—DANGEROUS" in letters not less than 7/16 inch in height. When space will not permit such marking on ends of kegs or drums, it may be applied to the side of the container. The tops of boxes, except those referred to in paragraph (a)(1) to (7) of this section, must be marked "THIS SIDE UP".

[29 FR 18683, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.65, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.66 Detonators.

(a) Unless otherwise specified in this section, detonators must be packed in accordance with the following:

(1) They must be snugly packed in strong inside packagings.

(2) Inside packagings must be snugly packed in an outside packaging specified in paragraph (e) of this section.

(3) For devices containing no more than 10 grams of explosive (excluding ignition and delay charges):

(i) No more than 50 devices may be packed in one inside packaging;

(ii) No more than 500 devices may be packed in one outside packaging; and

(iii) The gross weight of the completed package may not exceed 150 pounds or the gross weight permitted by the specification for the outside packaging used, whichever is less.

(b) Detonators that are blasting caps (including percussion activated) or delay connectors in metal tubes, must be packed as specified in paragraph (a) of this section. In addition:

(1) They must be packed in inside packagings with the open ends of any device covered with an appropriate cushioning material;

(2) Inside packagings must be snugly packed in intermediate packagings consisting of cartons, or wrappings made of paper, plastic, or pasteboard;

(3) Intermediate packagings must be separated from the outside packaging by at least 1 inch of cushioning material; and

(4) For devices containing no more than 3 grams of explosive (excluding ignition and delay charges):

(i) No more than 110 devices may be packed in one inside packaging; and

(ii) No more than 5,000 devices may be packed in one outside packaging.

(c) Detonators that are electric blasting caps, delay connectors in plastic sheaths, or blasting caps with empty plastic tubing, must be packed as specified in paragraph (a) of this section, except that:

(1) Devices containing no more than 3 grams of explosive (excluding ignition and delay charges) may be packed as follows:

(i) No more than 100 devices may be packed in one inside packaging; and

(ii) No more than 1,000 devices may be packed in one outside packaging.

(2) Devices that are electric blasting caps with leg wires 4 feet long or longer, delay connectors in plastic sheaths, or blasting caps with empty plastic tubing 12 feet long or longer, and contain no more than 1 gram of explosive (excluding ignition and delay charges) may be offered for transportation and transported in an IME Standard 22 container or compartment without the outside packaging specified in paragraph (e)(1) or (e)(2) of this section if:

(i) The devices are packed as specified in paragraph (a)(1) and (a)(3)(i) of this section;

(ii) There are no more than 1000 detonators in the IME Standard 22 container or compartment; and

(iii) No material is loaded on top of the IME Standard 22 container, or no material is loaded against the outside of the door of the IME Standard 22 compartment.

(3) Inside packaging is not required for electric blasting caps when packed in inside pasteboard tubes, or when their leg wires are wound on spools with the caps either placed inside the spool or securely taped to the wire on the spool, so as to restrict freedom of movement of the caps and to protect them from impact forces.

(d) Detonators that are blasting caps with safety fuse, blasting caps with metal clad mild detonating cord, blasting caps with detonating cord, or blasting caps with shock tubes, must be packed in accordance with the requirements of paragraph (a) of this section, except that:

(1) The blasting caps are not required to be attached to the safety fuse, metal clad mild detonating cord, detonating cord, or shock tube; and

(2) Inside packagings are not required if the packing configuration restricts freedom of movement of the caps and protects them from impact forces.

(e) Detonators with or without inside packaging as provided for in paragraphs (a) through (d) of this section, must be packed in the following outside packagings.

(1) Specification 14, 15A, 16A, or 19B (§§ 178.165, 178.168, 178.185, 178.191 of this subchapter). Wooden boxes.

(2) DOT Specification 12H, 23F, or 23H (§§ 178.209, 178.214, 178.219 of this subchapter) fiberboard box.

(3) IME Standard 22 container or compartment when the detonators conform with conditions and limitations specified in paragraph (c)(2) of this section.

(f) Each outside packaging containing detonators must be plainly marked "DETONATORS—HANDLE CAREFULLY" and bear the appropriate explosives label specified in § 172.411 of this subchapter.

(g) Devices subject to this section and approved by an agency listed in § 173.86(b) before January 1, 1980, may be transported subject to conditions of the approval and in accordance with regulations in effect on October 31, 1979, until December 31, 1985. Applicability of this paragraph is further limited to detonators packaged for transportation prior to January 1, 1985.

[Amdt. 173-134, 44 FR 70730, Dec. 10, 1979, as amended by Amdt. 173-149, 46 FR 49892, Oct. 8, 1981; Amdt. 173-182, 50 FR 804, Jan. 7, 1985]

§ 173.68 Detonating primers.

(a) Detonating primers that are blasting caps with detonating cord, and delay connectors with detonating cord pigtails, must be packed in accordance with the following:

(1) They must be snugly packed in inside packagings;

(2) Inside packagings must be snugly packed in an outside packaging specified in paragraph (d) of this section;

(3) No more than 50 devices may be packed in one inside packaging;

(4) No more than 500 devices may be packed in one outside packaging; and

(5) The gross weight of the completed package may not exceed 150 pounds or the maximum gross weight permitted by the specification for the outside packaging used, whichever is less.

(b) Detonating primers that are blasting caps with detonating cord in a coil configuration must be packed as specified in paragraph (a) of this section, except the use of inside packaging is not required if the packing configuration restricts movement of the caps and protects them from impact forces.

(c) All other unspecified types of detonating primers may only be offered for transportation if they are packed in accordance with the requirements of paragraph (a) of this section, except that inside packagings are not required for devices that are packed in individual pasteboard, metal, plastic, or wooden tubes.

(d) Detonating primers, with or without inside packagings, as provided for in paragraphs (a) through (c) of this section, must be packed in one of the following outside packagings:

(1) Specification 14, 15A, 16A, or 19B (§§ 178.165, 178.168, 178.185, 178.191 of this subchapter). Wooden boxes.

(2) DOT specification 12H, 23F, or 23H (§§ 178.209, 178.214, 178.219 of this subchapter) fiberboard box.

(e) Each outside packaging of detonating primers must be plainly marked "DETONATING PRIMERS—HANDLE CAREFULLY" and must bear the appropriate label specified in § 172.411 of this subchapter.

(f) Devices subject to this section, which have been approved by an agency listed in § 173.86(b) before January 1, 1980, may be transported subject to the conditions of the approval and in accordance with the regulations in effect on October 31, 1979, until December 31, 1984.

[Amdt. 173-134, 44 FR 70731, Dec. 10, 1979, as amended by Amdt. 173-149, 46 FR 49892, Oct. 8, 1981]

§ 173.69 Detonating fuzes, Class A, with or without radioactive components, detonating fuze parts containing an explosive, boosters, bursters, or supplementary charges.

(a) Detonating fuzes, class A with or without radioactive components, detonating fuze parts containing an explosive, boosters, bursters, or supplementary charges, when shipped not assembled in projectiles, bombs, etc., must be packed and well secured in strong, tight wooden or metal boxes.

NOTE 1: A fuze with any radioactive component is also subject to the applicable provisions of Subpart I of this part for the radioactive material.

(b) The gross weight of one outside package containing detonating fuzes class A, must not exceed 150 pounds Boosters, bursters and supplementary charges, without detonators, when shipped separately, must not exceed a gross weight of 300 pounds.

(c) Each outside package must be plainly marked "DETONATING FUZES CLASS A EXPLOSIVES—HANDLE CAREFULLY—DO NOT STORE OR LOAD WITH ANY HIGH EXPLOSIVES," or "DETONATING FUZES, CLASS A EXPLOSIVES, RADIOACTIVE—HANDLE CAREFULLY—DO NOT STORE OR LOAD WITH ANY HIGH EXPLOSIVES," or "BOOSTERS (EXPLOSIVE)—HANDLE CAREFULLY," or "BURSTERS (EXPLOSIVE)—HANDLE CAREFULLY," or "SUPPLEMENTARY CHARGES (EXPLOSIVE)—HANDLE CAREFULLY," as the case may be.

(49 U.S.C. 1655(c); 49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[29 FR 18683, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.69, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.70 Diazodinitrophenol or lead mononitroresorcinate.

(a) The offering of diazodinitrophenol or lead mononitroresorcinate in a dry condition for transportation is forbidden except as a component of manufactured articles such as percussion caps, detonators, blasting caps, and exploders.

(b) Diazodinitrophenol or lead mononitroresorcinate must be packed wet with not less than 40 percent by weight of water in a specification container 5 or 5B (§§ 178.80, 178.82 of this subchapter) metal barrel or drum, with inside containers which must be bags made of at least 10-ounce cotton duck, rubber, or rubberized cloth. Each bag must be securely closed. The bags containing diazodinitrophenol or lead mononitroresorcinate must be placed in a rubber bag, rubberized cloth bag, or bag made of suitable watertight material and then placed in the barrel or drum. Any empty space in the outside bag must be filled with water and this bag securely closed. The dry weight of diazodinitrophenol in one outside container must not exceed 220 pounds and the dry weight of lead mononitroresorcinate in one outside container must not exceed 100 pounds.

(c) Sufficient outage in outside container must be allowed to prevent rupturing of container in freezing weather, or a mixture of denatured alcohol and water may be used to prevent freezing in transit.

(d) Each barrel or drum must be plainly marked "INITIATING EXPLOSIVE—DANGEROUS—DO NOT STORE OR LOAD WITH ANY HIGH EXPLOSIVE."

[29 FR 18683, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

Editorial Note: For Federal Register citations affecting § 173.70, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.71 Fulminate of mercury.

(a) The offering of fulminate of mercury in a dry condition for transportation is forbidden, except as a component of manufactured articles such as percussion caps, detonators, blasting caps, and exploders.

(b) Fulminate of mercury must be packed wet with not less than 25 percent by weight of water in a specification container 5 or 5B (§§ 178.80 178.82 of this subchapter) metal barrel or drum, 17H (§ 178.118 of this subchapter) metal drum (single-trip), with an inside container which must be a bag made of 4-ounce duck. Inside the bag and over the fulminate, there must be placed a cap of the same fabric and of the same diameter as the bag. The bag must be securely tied and placed in a strong grain bag. The grain bag must also be securely tied. The bag and contents must be packed in the center of the metal barrel or drum and must be entirely surrounded by not less than three inches of well-packed sawdust saturated with water. The metal barrel or drum must be lined with a heavy, close-fitting, jute bag closed by secure sewing to prevent escape of sawdust. The barrel or drum must be inspected carefully and all leaks stopped. The dry weight of fulminate in one outside container must not exceed 150 pounds.

(c) If shipment of fulminate is to take place at a time that freezing weather is to be anticipated, a mixture of denatured ethyl alcohol and water of such proportions that freezing will not occur in transit must be used.

(d) Each barrel or drum must be plainly marked "INITIATING EXPLOSIVE—DANGEROUS—DO NOT STORE OR LOAD WITH ANY HIGH EXPLOSIVE."

[29 FR 18683, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-81, 39 FR 17315, May 15, 1974; 39 FR 17847, May 21, 1974; Amdt. 173-94, 41 FR 16065, Apr. 15, 1976]

§ 173.72 Guanyl nitrosamino guanylidene hydrazine.

(a) The offering of guanyl nitrosamino guanylidene hydrazine in a dry condition for transportation is forbidden, except as a component of manufactured articles such as percussion caps, detonators, blasting caps, and exploders.

(b) Guanyl nitrosamino guanylidene hydrazine must be packed wet with not less than 30 percent by weight of water in a specification container 5 or 5B (§§ 178.80, 178.82 of this subchapter) metal barrel or drum, 17H (§ 178.118 of this subchapter) metal drum (single-trip), with an inside container which must be a bag made of 4-ounce duck. Inside the bag and over the guanyl nitrosamino guanylidene hydrazine, there must be placed a cap of the same fabric and of the same diameter as the bag. The bag must be securely tied and placed in a strong grain bag. This grain bag must also be securely tied. The bag and contents must be packed in the center of the metal barrel or drum, and must be entirely surrounded by not less than three inches of well-packed sawdust saturated with water. The metal barrel or drum must be lined with a heavy, close-fitting, jute bag closed by secure sewing to prevent escape of sawdust. The barrel or drum must be inspected carefully and all leaks stopped. The dry weight of guanyl nitrosamino guanylidene hydrazine in one outside container must not exceed 75 pounds.

(c) If shipment of guanyl nitrosamino guanylidene hydrazine is to take place at a time that freezing weather is to be anticipated, a mixture of denatured ethyl alcohol and water of such proportions that freezing will not occur in transit must be used.

(d) Each barrel or drum must be plainly marked "INITIATING EXPLOSIVE—DANGEROUS—DO NOT STORE OR LOAD WITH ANY HIGH EXPLOSIVE."

[29 FR 18683, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-81, 39 FR 17315, May 15, 1974; Amdt. 173-94, 41 FR 16065, Apr. 15, 1976]

§ 173.73 Lead azide.

(a) The offering of lead azide in a dry condition for transportation is forbidden, except as a component of manufactured articles such as percussion caps, detonators, blasting caps, and exploders.

(b) Lead azide, dextrinated type, or otherwise prepared to effectively control grain size, must be packed wet with not less than 20 percent by weight of water in a specification container 5 or 5B (§§ 178.80, 178.82 of this subchapter) metal barrel or drum, 17H (§ 178.118 of this subchapter) metal drum (single-trip), with an inside container which must be a bag made of 4-ounce duck. Inside the bag and over the lead azide, there must be placed a cap of the same fabric and of the same diameter as the bag. The bag must be securely tied and placed in a strong grain bag. This grain bag must also be securely tied. The bag and contents must be packed in the center of the metal barrel or drum, and must be entirely surrounded by not less than three inches of well-packed sawdust saturated with water. The metal barrel or drum must be lined with a heavy, close-fitting, jute bag closed by secure sewing to prevent escape of sawdust. The barrel or drum must be inspected carefully and all leaks stopped. The dry weight of lead azide in one container must not exceed 150 pounds.

(c) If shipment of lead azide is to take place at a time that freezing weather is to be anticipated, a mixture of denatured ethyl alcohol or other suitable antifreeze and water of such proportions that freezing will not occur in transit must be used.

(d) Each barrel or drum must be plainly marked "INITIATING EXPLOSIVE—DANGEROUS—DO NOT STORE OR LOAD WITH ANY HIGH EXPLOSIVE."

[29 FR 18683, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-81, 39 FR 17315, May 15, 1974; Amdt. 173-94, 41 FR 16065, Apr. 15, 1976]

§ 173.74 Lead styphnate.

(a) The offering of lead styphnate (lead trinitroresorcinate) or barium styphnate, monohydrate in a dry condition for transportation is forbidden, except as a component of manufactured articles such as percussion caps, detonators, blasting caps, and exploders.

(b) Lead styphnate (lead trinitroresorcinate) or barium styphnate, monohydrate must be packed wet with at least 20 percent by weight of water in a Specification 5 or 5B (§§ 178.80, 178.82 of this subchapter) metal barrel or drum, or a Spec. 17H (§ 178.118 of this subchapter) metal drum (single-trip), lined with a heavy, close-fitting jute bag closed by secure sewing. The lead styphnate (lead trinitroresorcinate) or barium styphnate, monohydrate shall be placed in an inside bag made of rubber or rubberized cloth. This bag should be divided into a number of smaller packages. Inside the bag and over the lead styphnate, (lead trinitroresorcinate) or barium styphnate, monohydrate there must be placed a cap of the same fabric and of the same diameter as the bag. The bag and contents must be packed in the center of the metal barrel or drum, and must be entirely surrounded by at least three inches of well-packed sawdust saturated with water. The barrel or drum must be inspected carefully and be determined free of leaks. The dry weight of lead styphnate (lead trinitroresorcinate) or barium styphnate, monhydrate in one outside container may not exceed 150 pounds.

(c) If lead styphnate (lead trinitroresorcinate) or barium styphnate, monhydrate is to be transported during freezing weather it must be wet with a mixture of denatured ethyl alcohol and water so that it does not freeze.

(d) Each barrel or drum must be plainly marked "INITIATING EXPLOSIVE—DANGEROUS—DO NOT STORE OR LOAD WITH ANY HIGH EXPLOSIVE."

[Amdt. 173-81, 39 FR 17315, May 15, 1974, and Amdt. 173-187, 50 FR 11702, Mar. 25, 1985]

§ 173.75 Nitro mannite.

(a) The offering of nitro mannite in a dry condition for transportation is forbidden, except as a component of manufactured articles such as percussion caps, detonator, blasting caps, and exploders.

(b) Nitro mannite must be packed wet with not less than 40 percent by weight of water in a specification container 5 or 5B (§§ 178.80, 178.82 of this subchapter) metal barrel or drum, with inside container which must be bags made of at least 10-ounce cotton duck, rubber or rubberized cloth. Each bag must be securely closed. These bags containing the nitro mannite must then be placed in a rubber bag, rubberized cloth bag, or bag made of suitable watertight material and then placed in the barrel or drum. Any empty space in the outside bag must be filled with water and this bag securely closed. The dry weight of nitro mannite in one outside container must not exceed 100 pounds.

(1) Spec. 21C (§ 178.224 of this subchapter). Fiber drums not over 30 gallons capacity of at least nine-ply construction having, in addition, a sheet of steel having a minimum base box of 75 pounds, not less than 0.008 inch thick, wound between the fifth and sixth plies. The inside ply of kraft paper shall be laminated on each side with polyethylene to form a waterproof lining. The bottom head shall be of fiber, metal covered on the outside. Nitro mannite must be packed wet with not less than 40 percent by weight of water and shall be contained in at least two tightly sealed polyethylene bags of at least 0.004 inch thickness and this unit shall then be placed in a tightly closed polyethylene bag of at least 0.004 inch thickness and this assembly shall be placed within a 0.006 inch thickness polyethylene or other suitable plastic bag, completely filled with water and tightly closed. The 0.006 inch plastic bag shall be of such size as to completely fill the outside shipping container. The dry weight of nitro mannite in one outside container must not exceed 100 pounds.

(c) Sufficient outage in outside container must be allowed to prevent rupturing of container in freezing weather, or a mixture of denatured ethyl alcohol and water may be used to prevent freezing in transit.

(d) Each barrel or drum must be plainly marked "INITIATING EXPLOSIVE—DANGEROUS—DO NOT STORE OR LOAD WITH ANY HIGH EXPLOSIVE."

[29 FR 18683, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-81, 39 FR 17316, May 15, 1974; Amdt. 173-94, 41 FR 16065, Apr. 15, 1976]

§ 173.76 Nitrosoguanidine.

(a) The offering of nitrosoguanidine in a dry condition for transportation is forbidden except as a component of manufactured articles such as percussion caps, detonators, blasting caps, and exploders.

(b) Nitrosoguanidine must be packed wet with not less than 10 percent by weight of water in a specification container 5 or 5B) §§ 178.80, 178.82 of this subchapter) metal barrel or drum, 17H (§ 178.118 of this subchapter) metal drum (single-trip) with an inside container which must be a bag made of strong cloth, which must in turn be placed in the barrel or drum. The dry weight of nitrosoguanidine in one outside container must not exceed 75 pounds.

(c) Each barrel or drum must be plainly marked "INITIATING EXPLOSIVE—DANGEROUS—DO NOT STORE OR LOAD WITH ANY HIGH EXPLOSIVE."

[29 FR 18683, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-81, 39 FR 17316, May 15, 1974; Amdt. 173-94, 41 FR 16065, Apr. 15, 1976]

§ 173.77 Pentaerythrite tetranitrate.

(a) The offering of pentaerythrite tetranitrate in a dry condition for transportation is forbidden, except as a component of manufactured articles such as percussion caps, detonators, blasting caps, and exploders.

(b) Pentaerythrite tetranitrate must be packed wet with not less than 40 percent by weight of water in a specification container 5 or 5B (§§ 178.80, 178.82 of this subchapter) metal barrel or drum, 17H (§ 178.118 of this subchapter) metal drum (single-trip) with inside containers which must be bags made of at least 10-ounce cotton duck, rubber, or rubberized cloth. Each bag must be securely closed. These bags containing pentaerythrite tetranitrate must then be placed in a rubber bag, rubberized cloth bag, or bag made of suitable watertight material and then placed in the barrel or drum. Any empty space in the outside bag must be filled with water and this bag securely closed. The dry weight of pentaerythrite tetranitrate in one outside container must not exceed 300 pounds.

(c) Sufficient outage in outside container must be allowed to prevent rupturing of container in freezing weather, or a mixture of denatured ethyl alcohol or other suitable anti-freeze and water may be used to prevent freezing in transit.

(d) Each barrel or drum must be plainly marked "INITIATING EXPLOSIVE—DANGEROUS—DO NOT STORE OR LOAD WITH ANY HIGH EXPLOSIVE."

[29 FR 18683, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-81, 39 FR 17316, May 15, 1974; Amdt. 173-94, 41 FR 16066, Apr. 15, 1976]

§ 173.78 Tetrazene.

(a) The offering of tetrazene (guanyl nitrosamino guanyl tetrazene) in a dry condition for transportation is forbidden, except as a component of manufactured articles such as percussion caps, detonators, blasting caps, and exploders.

(b) Tetrazene (guanyl nitrosamino guanyl tetrazene) must be packed wet with not less than 30 percent by weight of water in a specification container 5 or 5B (§§ 178.80, 178.82 of this subchapter) metal barrel or drum, 17H (§ 178.118 of this subchapter) metal drum (single-trip) with an inside container which must be a bag made of 4-ounce duck. Inside the bag and over the tetrazene, there must be placed a cap of the same fabric and of the same diameter as the bag. The bag must be securely tied and placed in a strong grain bag. This grain bag must also be securely tied. The bag and contents must be packed in the center of the metal barrel or drum, and must be entirely surrounded by not less than three inches of well-packed sawdust saturated with water. The metal barrel or drum must be lined with a heavy, close-fitting, jute bag closed by secure sewing to prevent escape of sawdust. The barrel or drum must be inspected carefully and all leaks stopped. The dry weight of tetrazene in one outside container must not exceed 75 pounds.

(c) If the shipment of tetrazene is to take place at a time that freezing weather is to be anticipated, it must be wet with a mixture of denatured ethyl alcohol and water of such proportions that freezing will not occur in transit.

(d) Each barrel or drum must be plainly marked "INITIATING EXPLOSIVE—DANGEROUS—DO NOT STORE OR LOAD WITH ANY HIGH EXPLOSIVE."

[29 FR 18683, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-81, 39 FR 17316, May 15, 1974; Amdt. 173-94, 41 FR 16066, Apr. 15, 1976]

§ 173.79 Jet thrust units (jato), Class A explosives; rocket motors, Class A explosives; igniters, jet thrust (jato), Class A explosives; and igniters, rocket motor, Class A explosives.

(a) Jet thrust units (jato), rocket motors, jet thrust (jato) igniters, and rocket motor igniters, which are Class A explosives must be packaged as follows:

(1) Specification 14, 15A, 15E, 16A, or 19B (§§ 178.165, 178.168, 178.172, 178.185, 178.191 of this subchapter). Wooden boxes, or wooden boxes, fiberboard lined.

(2) Wooden boxes, wooden crates, or other packagings of approved military specifications which comply with § 173.7(a).

(b) Jet thrust units, class A explosives or rocket motors, class A explosives, must not be shipped with igniters assembled therein unless shipped by, for, or to the Department of the Army, the Department of the Navy, or the Department of the Air Force.

(c) Jet thrust units Class A explosives or rocket motors, Class A explosives, may be packaged in the same outside packaging with their separately packaged igniters (or igniter components), Class A, B, or C explosives only when shipped by or for the Department of Defense (DOD) and in accordance with established practices and procedures specified by DOD.

(d) Each package must be plainly marked "JET THRUST UNITS, CLASS A EXPLOSIVES", "ROCKET MOTORS, CLASS A EXPLOSIVES", "IGNITERS, JET THRUST, CLASS A EXPLOSIVES", or "IGNITERS, ROCKET MOTOR, CLASS A EXPLOSIVES", as appropriate.

[Amdt. 173-6, 34 FR 7160, May 1, 1969, as amended by Amdt. 173-94, 41 FR 16066, Apr. 15, 1976; Amdt. 173-138, 45 FR 32694, May 19, 1980; Amdt. 173-149, 46 FR 49892, Oct. 8, 1981]

§ 173.80 Charged well casing jet perforating guns.

(a) Charged well casing jet perforating guns may be transported only by highway and only by private carriers engaged in well operations. These guns may be transported as Class C explosives if the total weight of the explosive contents of the shaped charges assembled to the guns does not exceed 20 pounds. See § 173.110.

(b) Charged well casing jet perforating guns of the steel tube type must be packed without blasting caps, electric blasting caps, or other firing devices affixed to or installed in the guns and transported in specifically constructed bodies of motor vehicles operated by private carriers engaged in well operations whose motor vehicles transporting such guns must have specially built racks or carrying cases designed and constructed so that the guns are held securely in place during transportation and are not subject to damage by contact, one to the other or other articles or materials carried on the vehicle. Shaped charges assembled in the steel tubes must be of the type described in § 173.53(h)(1), except that each shaped charge shall contain not over 4 ounces of high explosive and each shaped charge if not completely enclosed in glass or metal must be fully protected by a metal cover after installation in the gun.

(c) Charged well casing jet perforating guns of the metallic strip or tubular framework type must be packed without blasting caps, electric blasting caps, or other firing devices affixed to or installed in the guns and transported in specially constructed bodies of motor vehicles operated by private carriers engaged in well operations whose motor vehicles transporting such guns must have specially built racks or carrying cases designed and constructed so that the guns are held securely in place during transportation and are not subject to damage by contact, one to the other or other articles or materials carried on the vehicle. Shaped charges assembled in the metallic strips or tubular framework must be of the type described in § 173.53(h)(1), except that each shaped charge shall contain not over 4 ounces of high explosive and each shaped charge if not completely enclosed in glass or metal must be fully protected by a metal cover after installation in the gun.

(d) The charged well casing jet perforating guns described in paragraphs (b) and (c) of this section and the bodies of motor vehicles transporting such guns must be so designed and constructed so that the guns are held securely in place during transportation and are not subject to damage by contact, one to the other or other articles or materials carried on the vehicle. The assembled gun or guns packed as required by paragraph (b) or (c) of this section must not extend beyond the body of the vehicle and must be secured in the body of the motor vehicle in a fixed position so as to prevent movement relative to each other or in the body of the motor vehicle.

(e) Blasting caps, electric blasting caps, or other firing devices transported on any motor vehicle operated by private carriers engaged in well operations transporting charged well casing jet perforating guns shall be segregated; each kind from every other kind, and from jet perforating guns, tools or other supplies. Blasting caps, electric blasting caps, or other firing devices shall be carried in a container having individual pockets for each such device or in a fully enclosed steel container lined with nonsparking material. No more than two blasting caps, electric blasting caps, or other firing devices per gun shall be transported on the same motor vehicle transporting well casing jet perforating guns.

[Amdt. 173-165, 48 FR 28100, June 20, 1983]

§ 173.81 Detonating cord.

(a) Detonating cord shall be packed in wooden or fiberboard boxes.

(b) Each outside packaging shall be plainly marked "DETONATING CORD—HANDLE CAREFULLY".

(c) Detonating cord having an explosive content not exceeding 100 grains per linear foot may be offered for transportation and transported as a class C explosive if the gross weight of all packages of detonating cord does not exceed 100 pounds per—

(1) transport vehicle, freight container or cargo only aircraft.

(2) offshore down hole tool pallet carried on a cargo vessel.

(3) cargo compartment of a cargo vessel.

(4) passenger-carrying aircraft used to transport personnel to remote work sites, such as offshore drilling units.

[Amdt. 173-182, 50 FR 804, Jan. 7, 1985]

§ 173.86 New explosives definitions; approval and notification.

(a) As used in this section, "new explosive" means an explosive compound, mixture or device, produced by a person who:

(1) Has not previously produced that explosive compound, mixture or device; or

(2) Has previously produced the explosive compound, mixture or device, but has made a change in the formulation, design, process or production equipment. An explosive compound, mixture or device will not be considered a "new explosive" if an agency listed in paragraph (b) of this section has determined and confirmed in writing to the Director, OHMT that there are no significant differences in hazard characteristics from the explosive compound, mixture or device previously approved.

(b) No person may offer a new explosive for transportation unless it has been examined and assigned a recommended shipping description and hazard class by the Bureau of Explosives or the Bureau of Mines, U.S. Department of the Interior and classed and approved by the Director, OHMT; or examined, classed, and approved by one of the following agencies:

(1) U.S. Deparment of Energy (DOE) for new explosives made by, or under the direction or supervision of DOE when tested in accordance with the Explosives Hazardous Classification procedures contained in DOT TB 700-2 (May 19, 1967), or

(2) U.S. Army Material Development and Readiness Command (DRCSF), Naval Sea Systems Command (NAVSEA 06H), or HQUSAF (IGD)/SEV/ for new explosives made by, or under the direction or supervision of the Department of Defense when tested in accordance with Explosives Hazard Classification procedures contained in DOD TB 700-2 (May 19, 1967), (NAVSEAINST 8020.8 AFTO 11A-1-47, DSAR 8220.1).

(c) Each person who offers a new explosive for transportation must file a copy of the approval for the new explosive accompanied by a supporting laboratory report or equivalent data with the Director, OHMT before offering the new explosive for transportation, unless the new explosive is:

(1) Covered under an approval issued by the Director, OHMT;

(2) Being transported under paragraph (d), (e), (f), or (g) of this section; or

(3) A new DOD explosive covered by a security classification.

(d) Notwithstanding paragraph (b) of this section, any person may offer a sample of a new explosive that has not been approved for transportation by railroad, highway, or vessel to a laboratory for examination if:

(1) The new explosive has been assigned a tentative shipping description and class in writing by one of the agencies listed in paragraph (b) of this section;

(2) The sample consists of no more than five pounds of the new explosive;

(3) The new explosive is packaged as required in this part according to the tentative description and class assigned unless otherwise specified in writing by one of the agencies listed in paragraph (b) of this section; and

(4) The package is labeled as required by this subchapter and the following is marked on the package:

(i) The words "SAMPLE FOR LABORATORY EXAMINATION";

(ii) The net weight of the new explosive, and

(iii) The tentative shipping description.

(e) Notwithstanding paragraph (b) of this section, a manufacturer of a new explosive that has not been examined or approved may transport that new explosive from where it was produced to an explosive testing facility if:

(1) The new explosive is not a forbidden explosive or an initiating explosive according to this subchapter;

(2) The new explosive is a compound or mixture it must be described as high explosive or high explosive, liquid, as appropriate (other than when contained in a device) and packed, marked, labeled, and described on the shipping paper as required by this subchapter;

(3) The new explosive is a device it must be assigned a tentative description and class by the owner and packed, marked, labeled, and described on the shipping paper as required by this subchapter based on its tentative description and class;

(4) The new explosive is transported in a motor vehicle operated by the owner of the explosive, and

(5) The new explosive is accompanied by a person, in addition to the driver of the motor vehicle, who is qualified by training and experience to handle the explosive.

(f) Notwithstanding the provisions of paragraph (b) or (d) of this section, the Director, Office of Hazardous Materials Transportation may approve a new explosive on the basis of an approval issued for the explosive by the competent authority of a foreign government, or, when examination of explosives by the Bureau of Explosives or Bureau of Mines is impracticable, on the basis of reports of tests conducted by disinterested third parties, or may approve the transportation of an explosives sample for the purpose of examination by the Bureau of Explosives, or the Bureau of Mines or other government agency.

(g) Notwithstanding the provisions of paragraph (b) of this section, an explosive may be transported under the provisions of §§ 171.11, 171.12 or § 176.11 without the approval of the Director, Office of Hazardous Materials Transportation provided that the Director, Office of Hazardous Materials Transportation has acknowledged, in writing, the acceptability of an approval issued by the competent authority of a foreign government pursuant to the provisions of the UN Recommendations, the ICAO Technical Instructions, the IMDG Code or other national or international regulations based on the provisions of the UN Recommendations. In such cases, a copy of the approval of the foreign competent authority, and a copy of the written acknowledgement of its acceptability must accompany each shipment of that explosive.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 173-95, 41 FR 15013, Apr. 9, 1976]

EDITORIAL NOTE: For Federal Register citations affecting § 173.86, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.87 Explosives in mixed packaging.

Unless specifically authorized by Parts 110-189 of this subchapter, explosives may not be packed in the same outside packaging with other articles. Inside packages of different explosives (except detonators and initiating explosives) may be packed in one outside packaging in accordance with the requirements of this subchapter if the gross weight of each inside package does not exceed 8 ounces and the gross weight of the completed package does not exceed 50 pounds.

[Amdt. 173-134, 44 FR 70731, Dec. 10, 1979]

CLASS B EXPLOSIVES; DEFINITIONS

§ 173.88 Definition of Class B explosives.

(a) Explosives, Class B, are defined as those explosives which in general function by rapid combustion rather than detonation and include some explosive devices such as special fireworks, flash powders, some pyrotechnic signal devices and liquid or solid propellant explosives which include some smokeless powders. These explosives are further specifically described in paragraphs (b) to (g) of this section.

(b) Ammunition for cannon with empty projectiles, inert-loaded projectiles, solid projectiles or without projectiles, or shell, and catapult charges exceeding 2 inches in diameter, is fixed ammunition assembled in a unit consisting of the cartridge case containing the propelling charge and primer with empty, inert-loaded, or solid projectiles, or without projectiles, which is fired from a cannon, mortar, gun, howitzer or recoilless rifle.

(c) Rocket ammunition is fixed ammunition which is fired from a tube, launcher, rails, trough, or other device as distinguished from cannon ammunition which is fired from a cannon, gun, or mortar. It consists of an igniter, a rocket motor, and empty projectile, inert-loaded projectile, or solid projectile.

(d) Special fireworks are manufactured articles designed primarily for the purpose of producing visible or audible pyrotechnic effects by combustion or explosion. (See § 173.100(r) for common fireworks.) Examples are toy torpedoes, railway torpedoes, some firecrackers and salutes, exhibition display pieces, aeroplane flares, illuminating projectiles, incendiary projectiles, incendiary bombs or incendiary grenades and smoke projectiles or smoke bombs fuzed or unfuzed and containing expelling charges but without bursting charges, flash powders in inner units not exceeding 2 ounces each, flash sheets in interior packages, flash powder or spreader cartridges containing not over 72 grains of flash powder each (see § 173.60 for shipments made as low explosives) and flash cartridges consisting of a paper cartridge shell, small-arms primer, and flash composition not exceeding 180 grains all assembled in one piece. Fireworks must be in a finished state, exclusive of mere ornamentation, as supplied to the retail trade and must be so constructed and packed that loose pyrotechnic composition will not be present in packages in transportation.

(e) Jet thrust units (jato), Class B explosives; rocket motors, Class B explosives; igniters, jet thrust (jato), Class B explosives; and igniters, rocket motors, Class B explosives:

(1) Jet thrust units (jato), Class B explosives, are metal cylinders containing a mixture of chemicals capable of burning rapidly and producing considerable pressure. Jet thrust units are designed to be ignited by an electric igniter. They are used to assist aeroplanes to take off.

(2) Rocket motor, Class B explosives, is a device containing a propelling charge and consisting of one or more continuous type combustion unit(s), closed at one end (closure may be an igniter with a thrust plate) and with a nozzle(s) at the other end. The propelling charge consists of a mixture of chemicals and/or chemical compounds which when ignited is capable of burning rapidly and producing considerable pressure and which will not sustain a detonation. (The rocket motor carries its own solid oxidizer-fuel combination.) Rocket motors, Class B explosives, should be nonpropulsive in shipment (see paragraphs (e)(2) (i) and (ii) of this section) Rocket motors, Class B explosives, are designed to be ignited by an electrically actuated device which may be an igniter, or by other means. They are used to propel and/or

provide thrust for guided missiles, rockets, or spacecraft.

(i) A rocket motor to be considered "nonpropulsive" must be capable of unrestrained burning and will not move appreciably in any direction when ignited by any means. Blast deflectors, thrust neutralizers or other similar devices must be proven by test prior to authorization for use.

(ii) Rocket motors, Class B explosives, may be shipped in a propulsive state only under conditions approved by the Department of Defense or the National Aeronautics and Space Administration.

(3) Igniters, jet thrust (jato), Class B explosives, and igniters, rocket motor, Class B explosives, are devices consisting of an electrically operated or remotely controlled ignition element and a fast burning composition which functions by rapid burning rather than detonation, assembled in a unit for use in igniting the propelling charge of jet thrust units, rocket motors, or rocket engines.

(f) *Propellant explosives, Class B.* Propellant explosives, Class B, are solid or liquid chemicals or chemical mixtures which function by combustion. The combustion is controlled by composition, size, form of grain, or other chemical or mechanical means. Any propellant is Class B which fails to detonate in five trials when tested (see Note 2) in the package in which it is offered for shipment. Propellant explosives, Class B, include smokeless powder for small arms (see Note 4), smokeless powder for cannon, liquid monopropellant fuel (see Note 3), smokeless powder, or solid propellant explosives for rockets, jet thrust units, or other devices. Black powder is not included in this classification and is defined specifically in § 173.53.

(g) Explosives power devices, Class B, are devices designed to operate ejecting apparatus or other mechanisms by means of a propellant explosive, Class B, and differ from explosive power devices, Class C, in that they contain larger or more powerful propellants. The devices must not rupture on functioning and must be of a type examined by the Bureau of Explosives and approved by the Director, OHMT, except as otherwise provided in § 173.51(b) and § 173.86(a).

NOTE 1: Fire-extinguisher charges containing not to exceed 50 grains of propellant explosives per unit are exempt from the regulations in Parts 170-189 of this chapter.

NOTE 2: In conducting the test, one propellant container shall be surrounded by inert loaded containers of the same weight, including one inert container placed on top of the propellant container. The propellant shall be ignited by means of a commercial electric squib placed within 4 inches of the bottom of the container. The presence of a crater and absence of flame shall be considered as evidences of detonation.

NOTE 3: A liquid monopropellant fuel is defined as any propellant in which the fuel and the oxidizer are physically or chemically combined in one form.

NOTE 4: Smokeless powder for small arms in quantities not exceeding 100 pounds net weight in one car or motor vehicle, except shipments by, for, or to the Department of the Army, Navy, or Air Force of the United States Government, shall be classed as a flammable solid for purposes of transportation when packaged in accordance with § 173.197a.

(h) Starter cartridges, jet engine, Class B explosives consist of plastic and/or rubber cases, each containing a pressed cylindrical block of propellant explosive and having in the top of the case a small compartment that incloses an electrical squib, small amounts of black powder, and smokeless powder, which constitutes an igniter. The starter cartridge is used to activate a mechanical starter for jet engines.

(i) Rocket engine (liquid), Class B explosives is a complete, self-contained rocket propulsion unit which contains an oxidizer and a fuel, each separated by an aluminum or stainless steel wall of not less than 0.250 inch thickness. Double walls are permitted. Pressurization of the propellant tanks is by use of a gas generator. The ignition source must be in an unarmed position for shipment. Rocket engines (liquid) are used to propel or provide thrust for rockets, missiles or spacecraft.

[29 FR 18683, Dec. 29, 1964, as amended by Order 72, 31 FR 6424, Apr. 28, 1966. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-104, 42 FR 11239, Feb. 28, 1977; Amdt. 173-138, 45 FR 32694, May 19, 1980]

§ 173.89 Ammunition for cannon with empty projectiles, inert-loaded projectiles, solid projectiles, tear gas projectiles or without projectiles.

(a) Ammunition for cannon with empty projectiles, inert-loaded projectiles solid projectiles, tear gas projectiles, or without projectiles must be well packed and properly secured in strong wooden or metal containers or in plastic containers of approved military specifications complying with § 173.7(a).

(b) Each outside package must be plainly marked "AMMUNITION FOR CANNON WITH EMPTY PROJECTILES", "AMMUNITION FOR CANNON WITH INERT-LOADED PROJECTILES", "AMMUNITION FOR CANNON WITH SOLID PROJECTILES", "AMMUNITION FOR CANNON WITHOUT PROJECTILES", OR "AMMUNITION FOR CANNON WITH TEAR GAS PROJECTILES, CLASS B EXPLOSIVES," as appropriate.

[Amdt. 173-110, 42 FR 57965, Nov. 7, 1977]

§ 173.90 Rocket ammunition with empty, inert-loaded, or solid projectiles.

(a) Rocket ammunition with empty, inert-loaded, or solid projectiles must be well packed and properly secured in strong wooden or metal containers.

(b) Each package must be plainly marked "ROCKET AMMUNITION WITH EMPTY PROJECTILES," "ROCKET AMMUNITION WITH INERT-LOADED PROJECTILES," or "ROCKET AMMUNITION WITH SOLID PROJECTILES," as appropriate.

[Order 72, 31 FR 6424, Apr. 28, 1966. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16066, Apr. 15, 1976]

§ 173.91 Special fireworks.

(a) Special fireworks, except as otherwise authorized, must be securely packed in containers complying with the following specifications:

(1) [Reserved]

(2) Specification 15A, 15B, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes. Gross weight not to exceed 500 pounds.

(3) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes. Gross weight not to exceed 65 pounds except as provided in paragraph (a)(5) of this section. Not permitted for illuminating projectiles and aeroplane flares.

(4) Fireworks that can be exploded en masse, by dropping the completed shipping container from a height of six feet or by the impact of a rifle bullet, if found safe for transportation, may be shipped in accordance with the regulations in this part applying to high explosives.

(5) Ship distress signals when packed in tight inside metal containers of not less than 24 gauge sheet iron or other metal of equal strength, securely closed by positive means (not friction) and of such design and so arranged as to completely fill the outside container, may be packed in Spec. 12B (§ 178.205 of this subchapter) fiberboard boxes. Gross weight not to exceed 95 pounds when boxes are made in accordance with § 178.205-29 of this subchapter.

(6) Illuminating projectiles, incendiary projectiles, and smoke projectiles exceeding 90 pounds each, or of not less than 4½ inches in diameter, may be offered for transportation without being boxed, only by, for, or to the Department of Defense (DOD) of the U.S. Government when securely blocked and braced in accordance with methods prescribed by DOD.

(i) Illuminating projectiles, incendiary projectiles, and smoke projectiles less than 4½ inches in diameter may be offered for transportation without being boxed, when palletized, only by, for, or to the Department of Defense (DOD) of the U.S. Government when securely blocked and braced in accordance with methods prescribed by DOD.

(b) Flash or spreader cartridges not exceeding 72 grains of flash powder each must be packed in containers complying with the following specifications:

(1) Specification 15A, 15B, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes or Spec. 12B (§ 178.205 of this subchapter) fiberboard boxes, with inside containers which must be cartons or tin cans containing not over

6 cartridges and not to exceed 150 cartons or cans to an outer box.

(c) Flash cartridges consisting of a paper cartridge shell, small arms primer, and flash composition, not exceeding 180 grains each, all assembled in one piece ready for firing must be packed in containers complying with the following specifications:

(1) Specification 15A, 15B, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes, or Spec. 12B (§ 178.205 of this subchapter) fiberboard boxes, with inside containers which must be cartons containing not to exceed 12 cartridges each and not more than 12 such cartons in one outside box.

(2) Flash cartridges, in quantity not exceeding 5 pounds, when in small interior wooden boxes, may be packed with nonexplosive, nonflammable or noncorrosive articles.

(d) Flash sheets must be packed in containers complying with the following specifications:

(1) Specification 15A, 15B, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes, or Spec. 12B (§ 178.205 of this subchapter) fiberboard boxes, with inside containers which must be an inner package or envelope containing not more than 6 flash sheets and not more than one dozen inner envelopes or packages inclosed in each inner pasteboard box or carton. Gross weight of wooden box not to exceed 150 pounds. Gross weight of fiberboard box not to exceed 65 pounds.

(2) Flash sheets, in quantity not exceeding 5 pounds, when in small interior wooden boxes, may be packed with nonexplosive, nonflammable, or noncorrosive articles.

(e) Photographic flash powder must be packed in containers complying with the following specifications:

(1) Specification 15A, 15B, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes, or Spec. 12B (§ 178.205 of this subchapter) fiberboard boxes, with inside containers which must be any inside container sufficiently strong to retain contents not exceeding 2 ounces each. If bottles are used, each bottle must be packed in a securely closed fiber mailing tube having metal ends. Not more than 4 dozen 2-ounce bottles may be packed in an outer wooden box. When packed in units not exceeding 1 ounce each without bottles in similar fiber mailing tubes and outer wooden boxes, the gross weight of one outside box must not exceed 150 pounds. Gross weight of fiberboard box not to exceed 65 pounds.

(2) Photographic flash powder, in quantity not exceeding 5 pounds, when in small interior wooden boxes, may be packed with nonexplosive, nonflammable, or noncorrosive articles.

(f) Railway torpedoes (track torpedoes) must be packed in containers complying with the following specifications:

(1) Spec. 15A, 15B, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.185, 178.190, or § 178.191 of this subchapter). Wooden boxes. Net weight not to exceed 125 pounds.

(2) Spec. 12H, 23F, or 23H (§ 178.209, § 178.214, or § 178.219 of this subchapter). Fiberboard boxes. Gross weight not to exceed 65 pounds.

(3) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes, with inside containers which must be cartons containing not to exceed one-half gross track torpedoes each. Gross weight of outside fiberboard box not to exceed 65 pounds.

(4) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes without inside containers may be used for not more than 50 track torpedoes provided the smallest dimension of the box is not less than 6 inches.

(g) Toy torpedoes must be securely packed as prescribed in this section in containers complying with the following specifications:

(1) Specification 15A, 15B, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes, or Spec. 12B (§ 178.205 of this subchapter) fiberboard boxes which must be constructed to comply with § 178.205-30 of this subchapter. Not more than 20 one-quarter gross cartons totalling not more than 5 gross of toy torpedoes are authorized per fiberboard box. Gross weight of fiberboard box must not exceed 35

pounds. Gross weight of wooden box must not exceed 65 pounds.

(2) Toy torpedoes of any kind must not be packed with other fireworks.

(3) Toy torpedoes containing a cap must be packed in sawdust, in inside paper or cardboard cartons. The size of the carton must be not less than 4 cubic inches for each grain of explosive.

(4) Toy torpedoes containing a mixture of potassium chlorate, black antimony and sulfur, must be packed in an inner container, containing not more than one-fourth gross. The capacity of this inner container must be not less than 105 cubic inches, and it must be divided into 12 equal compartments. All vacant space inside the container must then be filled with sawdust or fine shavings.

(5) The gross weight of a container of toy torpedoes must not exceed 65 pounds.

(h) Except as otherwise specified in this section the gross weight of one outside container of special fireworks must not exceed 500 pounds.

(i) *Marking.* Each outside container of special fireworks must be plainly marked in letters not less than 7/16 inch in height "SPECIAL FIREWORKS—HANDLE CAREFULLY—KEEP FIRE AWAY", except that each outside container of railway torpedoes must be plainly marked in letters not less than 7/16 inch in height "RAILWAY TORPEDOES—HANDLE CAREFULLY—KEEP FIRE AWAY".

(1) Outside containers of toy torpedoes must in addition be marked "TOY TORPEDOES".

[29 FR 18683, Dec. 29, 1964, as amended by Order 71, 31 FR 9070, July 1, 1966. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.91, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.92 Jet thrust units (jato), Class B explosives; rocket motors, Class B explosives; igniters, jet thrust (jato), Class B explosives; igniters, rocket motors, Class B explosives; and starter cartridges, jet engine, Class B explosives.

(a) Class B explosives covered by this section must be packaged in outside packagings complying with the following specifications:

(1) Specification 14, 15A, 15E, 16A, or 19B (§§ 178.165, 178.168, 178.172, 178.185, 178.191 of this subchapter). Wooden boxes, or wooden boxes, fiberboard lined.

(2) Specification 15B (§ 178.169 of this subchapter) wooden boxes. Authorized only for igniters, jet thrust, Class B explosives, or igniters, rocket motors, Class B explosives.

(3) Specification 23F (§ 178.214 of this subchapter) fiberboard boxes. Authorized only for igniters, jet thrust, Class B explosives; igniters, rocket motor, Class B explosives; or starter cartridges, jet engine, Class B explosives. Items must be packaged in tightly closed inside fiberboard boxes (at least 200-pound test (Mullen or Cady)) or metal containers. Starter cartridges, jet engine, must have igniter wires short-circuited when packed for shipment.

(4) Wooden boxes, wooden crates, or other packagings of approved military specification which comply with § 173.7(a).

(b) Jet thrust units, Class B explosives, or rocket motors, Class B explosives, must not be shipped with igniters assembled therein unless shipped by, for, or to the Department of Defense or the National Aeronautics and Space Administration.

(c) Jet thrust units, Class B explosives, or rocket motors, Class B explosives, may be packaged in the same outside packaging with their separately packaged igniters (or igniter components), Class A, B, or C explosives, only when shipped by or for the Department of Defense (DOD) and in accordance with established practices and procedures specified by DOD.

(d) Each package must be plainly marked "JET THRUST UNITS, CLASS B EXPLOSIVES", "ROCKET MOTORS, CLASS B EXPLOSIVES", "IGNITERS, JET THRUST, CLASS B EXPLOSIVES", "IGNITERS, ROCKET MOTORS, CLASS B EXPLOSIVES", or "STARTER CARTRIDGES, JET ENGINE, CLASS B EXPLOSIVES" as appropriate.

[Amdt. 173-6, 34 FR 7160, May 1, 1969, as amended by Amdt. 173-70, 38 FR 5308, Feb.

27, 1973; Amdt. 173-94, 41 FR 16066, Apr. 15, 1976; Amdt. 173-104, 42 FR 11239, Feb. 28, 1977; Amdt. 173-138, 45 FR 32694, May 19, 1980; Amdt. 173-149, 46 FR 49893, Oct. 8, 1981]

§ 173.93 Propellant explosives (solid) for cannon, small arms, rockets, guided missiles, or other devices, and propellant explosives (liquid).

(a) Propellant explosives (solid) for cannon, small arms, rockets, guided missiles, or other devices, and propellant explosives (liquid) when offered for transportation by carriers by rail freight, highway, or water, must be packed in containers complying with the following specifications (see paragraph (g)(1) of this section for shipments by cargo aircraft only):

(1) Specification 12H, 23G, or 23H (§ 178.209, 178.218, 178.219 of this subchapter) fiberboard boxes with inside securely closed polyethylene bags having a minimum wall thickness of 0.006-inch.

(2)—(3) [Reserved]

(4) Tight metal cases in tight wooden boxes, not over 200 pounds gross weight; or tight metal containers not over 200 pounds gross weight.

(5) Specification 14, 15A, or 19B (§§ 178.165, 178.168, 178.191 of this subchapter). Wooden boxes, metal-lined, Spec. 2F (§ 178.25 of this subchapter). Gross weight not to exceed 200 pounds.

(6) Specification 14, 15A, or 19B (§§ 178.165, 178.168, 178.191 of this subchapter). Wooden boxes, or Spec. 23F or 23H (§§ 178.214, 178.219 of this subchapter) fiberboard boxes, with inside cloth or paper bags, not exceeding 25 pounds net weight each and capable of withstanding at least two drops on end from a height of 4 feet, without breakage or sifting of contents. Outside container not to exceed 50 pounds net weight.

(7) [Reserved]

(8) Specification 14, 15A, 15B, 15C, or 19B (§§ 178.165, 178.168, 178.169, 178.170, 178.191 of this subchapter). Wooden boxes, or Spec. 12H, 23F, or 23H (§§ 178.209, 178.214, 178.219 of this subchapter) fiberboard boxes, with inside fiber or metal containers not exceeding 1½ pounds capacity each. Gross weight not to exceed 200 pounds in wooden boxes or 65 pounds in fiberboard boxes.

(9) Specification 14, 15A, 15B, 15C, or 19B (§§ 178.165, 178.168, 178.169, 179.170, 178.191 of this subchapter). Wooden boxes, or Spec. 23F or 23H (§§ 178.214, 178.219 of this subchapter) fiberboard boxes, with not more than four strong inside tight metal containers of not more than 25 pounds each. The gross weight in fiberboard boxes may not exceed 65 pounds.

(10) Specification 21C (§ 178.224 of this subchapter). Fiber drum. Drums having a wooden head must contain a strong, sift-proof liner. Net weight may not exceed 265 pounds. Shipment by rail freight is prohibited except in trailer-on-flat-car service.

(11) Specification 14, 15A, 16A or 19B (§§ 178.165, 178.168, 178.185, 178.191 of this subchapter). Wooden boxes, not lined, authorized only for grains not less than 1-inch in diameter or 3 inches in length, provided such grains are tightly packed and are coated with a protective material. Gross weight not to exceed 200 pounds.

(b) Propellant explosives (smokeless powder for cannon or small-arms) in water when offered for transportation by carriers by rail freight, highway, or water must be packed in containers complying with the following specifications:

(1) Specification 5, 5A, 5B, 6B, or 6C (§§ 178.80, 178.81, 178.82, 178.98, or 178.99 of this subchapter). Metal barrels or drums.

(2) Specification 17H (§ 178.118 of this subchapter). Steel drums (single-trip) not over 30-gallon capacity each.

(3) Specification 15A or 19B (§§ 178.168, 178.191 of this subchapter). Wooden boxes, metal-lined, Specification 2F (§ 178.25 of this subchapter).

(c) Igniters composed of black powder may be included in shipments of propellant explosives.

(d) Propellant explosives (unstable, condemned, or deteriorated smokeless powder for cannon or small arms) must be packed submerged in water in containers complying with the following specifications:

(1) Specification 5, 5A, 5B, 6B, or 6C (§§ 178.80, 178.81, 178.82, 178.98, or

178.99 of this subchapter). Metal barrels or drums.

(2) [Reserved]

(3) Specification 15A or 19B (§§ 178.168, 178.191 of this subchapter). Wooden boxes, metal-lined, Specification 2F (§ 178.25 of this subchapter).

(4) Spec. 103, 103-W, or 111A100-W-1 (§§ 179.200, 179.201 of this subchapter). Tank cars.

(5) Propellant explosives (unstable, condemned, or deteriorated smokeless powder for cannon or small arms) may not be offered for transportation by cargo aircraft only.

(e) Propellant explosives (liquid), when offered for transportation by rail freight, highway, or water, must be packed in containers complying with the following specifications (see § 173.93(g) for shipments by rail express):

(1) Specification 15A, 15B, 15E, or 19B (§§ 178.168, 178.169, 178.172, 178.191 of this subchapter). Wooden box or wooden box fiberboard lined, with inside polyethylene bottles having taped screw-cap closures, not over 1 gallon capacity each. Each bottle must be entirely contained within a polyethylene or other suitable plastic bag formed of material not less than 0.004 inch thickness, with ends securely closed. Each bottle in the plastic bag shall be enclosed in a tight metal container and be surrounded on all sides with at least 2 inches of incombustible cushioning material, cans in the outside box must likewise be cushioned from each other and sides, top, and bottom of the container.

(2) Specification 5B, 6B, 6C, 6D; also 17C or 17H (single-trip) containers (§§ 178.82, 178.98, 178.99, 178.102, 178.115, 178.118 of this subchapter). Metal barrel, drum, or cylindrical steel overpack, with inside Specification 2S (§ 178.35 of this subchapter) polyethylene container, packed inside a strong, tight metal drum. Inside steel drum must be surrounded on all sides with at least 2 inches of incombustible absorbent cushioning material uniformly distributed. Polyethylene containers are authorized only for liquids that will not react dangerously with the plastic or result in container failure.

(3) Outage requirements. Containers must not be entirely filled. Sufficient interior space must be left vacant to prevent leakage or distortion of containers due to the expansion of the contents from increase of temperature during transit.

(f) Each outside container must be plainly marked "PROPELLANT EXPLOSIVES (LIQUID), CLASS B," "PROPELLANT EXPLOSIVES (SOLID), CLASS B," or "PROPELLANT EXPLOSIVES (SOLID), CLASS B, in WATER," as the case may be. There may be added such additional marking as "Smokeless Powder for Cannon" or "Smokeless Powder for Small Arms," as the case may be.

(g) Propellant explosives, except as provided in paragraph (d)(5) of this section, when offered for transportation by cargo aircraft only must be packaged as follows (also authorized for transportation by carriers by rail freight, highway, or water):

(1) Solids in tightly closed metal cans or fiber containers, not exceeding 1 pound each, or in inside metal cans or fiber containers containing not more than one grain of propellant, not exceeding 5 pounds each, and liquids in polyethylene bottles compatible with contained liquid, with screw-cap closures taped, not exceeding 1-pound or 16 fluid ounces capacity each, packed in an outside wooden box, Spec. 15A, 15B, 15C, or 19B (§§ 178.168, 178.169, 178.170, 178.191 of this subchapter); or outside fiberboard box Spec. 12B, 23F, or 23H (§§ 178.205, 178.214, 178.219 of this subchapter). Not more than 1,000 small-arms primers packed in inside containers as prescribed by § 173.107 may be included in one outside shipping container with solid propellant explosives. Inside containers must be packed so as to prevent movement within the outside container. Not more than 10 pounds of propellant explosives may be shipped in one outside container. Each outside container must be plainly marked "PROPELLANT EXPLOSIVES (LIQUID), CLASS B," or "PROPELLANT EXPLOSIVES (SOLID), CLASS B," or "PROPELLANT EX-

PLOSIVES, CLASS B, and SMALL-ARMS PRIMERS," as the case may be.

[29 FR 18683, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.93, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.94 Explosive power devices, Class B.

(a) Explosive power devices, Class B may not be shipped with igniters assembled therein unless shipped by or for the Department of Defense (DOD) and in accordance with established practices and procedures specified by DOD. Explosive power devices, Class B, must be packed in outside containers complying with the following specifications:

(1) Specification 14, 15A, 15E, 16A, or 19B (§§ 178.165, 178.168, 178.172, 178.185, 178.191 of this subchapter). Wooden boxes or wooden boxes, fiberboard lined.

(2) Strong wooden or metal boxes or containers. Authorized only for shipments made by, for, or to the Departments of the Army, Navy, or Air Force of the United States Government.

(b) Explosive power devices, Class B packed in any other manner must be in containers of a type examined by the Bureau of Explosives and approved by the Director, OHMT.

(c) Each outside container must be plainly marked "EXPLOSIVE POWER DEVICES, CLASS B" *and* "HANDLE CAREFULLY—KEEP FIRE AWAY."

[29 FR 18683, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.94, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.95 Rocket engines (liquid), Class B explosives.

(a) Rocket engines (liquid), Class B explosives must be packaged as follows:

(1) Specification 14, 15A, 15E, 16A, or 19B (§§ 178.165, 178.168, 178.172, 178.185, 178.191 of this subchapter). Wooden boxes or wooden boxes, fiberboard lined.

(2) Wooden boxes or metal packagings of approved military specification which comply with § 173.7(a).

(b) Rocket engines (liquid), Class B explosives, may not be shipped with igniters or initiators assembled therein unless shipped by or for the Department of Defense (DOD) and in accordance with established practices and procedures specified by DOD.

(c) Rocket engines (liquid), Class B explosives, may be packed in the same outside packaging with their separately packaged igniters, jet thurst, Class B explosives when shipped by or for the Department of Defense (DOD) and in accordance with established practices and procedures specified by DOD.

(d) Each package must be plainly marked "ROCKET ENGINES (LIQUID), CLASS B EXPLOSIVES."

[Amdt. 173-6, 34 FR 7160, May 1, 1969, as amended by Amdt. 173-94, 41 FR 16066, Apr. 15, 1976; Amdt. 173-138, 45 FR 32694, May 19, 1980; Amdt. 173-149, 46 FR 49893, Oct. 8, 1981]

CLASS C EXPLOSIVES; DEFINITIONS

§ 173.100 Definition of Class C explosives.

(a) Explosives, Class C, are defined as certain types of manufactured articles which contain Class A, or Class B explosives, or both, as components but in restricted quantities, and certain types of fireworks. These explosives are further specifically described in this section.

(b) Small arms ammunition is fixed ammunition consisting of a metallic, plastic composition, or paper cartridge case, a primer, and a propelling charge, with or without bullet, projectile, shot, tear gas material, tracer components, or incendiary compositions, or mixtures, and is further limited to the following:

(1) Ammunition designed to be fired from a pistol, revolver, rifle, or shotgun held by the hand or to the shoulder.

(2) Ammunition of caliber less than 20 millimeters with incendiary solid inert or empty projectiles (with or without tracers), designed to be fired from machine guns or cannons.

(3) Blank cartridges including canopy remover cartridges, starter car-

tridges, and seat ejector cartridges, containing not more than 500 grains of propellant powder, provided that such cartridges shall be incapable of functioning en masse as a result of the functioning of any single cartridge in the container or as a result of exposure to external flame.

(4) Twenty millimeter ammunition other than specified in § 173.53(q).

(c) Explosive cable cutters are used for cutting cables, etc. They consist of a metal device containing a knife-edged component which is propelled by a small charge of an explosive compound.

(d) Cord, detonating *flexible* is a device consisting of a core of pentaerythrite tetranitrate, cyclotrimethylene- trinitramine or similar explosive overspun with tapes, yarns and plastics or waterproofing compounds without wire countering. Approval of detonating cord as a class C explosive is contingent upon:

(1) examination by an agency listed in § 173.86(b); and

(2) a demonstrated ability to confine blast effects of a detonation to the package as prepared for transportation, and without propagation of detonation to similar packages which surround it.

(e) Percussion fuzes, combination fuzes, and time fuzes are devices designed to ignite powder charges of ammunition or to initiate an intermediate charge (booster) in projectiles, bombs, etc. When such fuzes are assembled with booster charges they are properly described as "detonating fuzes" (see § 173.53(g)(2)).

(f) Tracer fuzes and tracers are devices which are attached to projectiles and contain a slow-burning composition to show the flight of projectiles at night.

(g) Cartridge bags, empty, with black powder igniters consist of empty bags having attached thereto an igniter composed of black powder. (See § 173.93 (b), (c), and (d) when shipped with propellant explosives.)

(h) Igniters consist of fiberboard, plastic, paper or metal tubes containing a small quantity of igniting compound which is ignited by the action of a primer, pull wire or scratch composition.

(i) Delay electric igniters consist of small metal, fiberboard, or pasteboard tubes containing a wire bridge in contact with a small quantity of ignition compound. The ignition compound is in contact with or in close proximity to a short piece of safety fuse.

(j) Electric squibs consist of small tubes or blocks containing a small quantity of ignition compound in contact with a wire bridge.

(k) Fuse lighters and fuse igniters are small cylindrical hollow pasteboard or metal tubes containing an igniting composition in one end, the other end being open to permit it to be placed on safety fuse.

(l) Safety squibs are small paper tubes containing a small quantity of black powder. One end of each tube is usually twisted and tipped with sulfur.

(m) Instantaneous fuse is cotton yarn impregnated with metal powder. No restrictions other than packing in strong wooden boxes or barrels plainly marked "INSTANTANEOUS FUSE" are prescribed in this part.

(n) Primers are devices used to ignite the powder charges of ammunition or the black powder bursting charges of projectiles. For small-arms ammunition the primers are "small-arm primers" or "percussion caps".

(o) Safety fuse, consisting of a core of black powder overspun with yarns, waterproofing compounds, and/or tapes must be packed in outside fiberboard boxes, wooden boxes, wooden barrels, bales, or metal containers, and must be described for shipping purposes as "SAFETY FUSE". No other restrictions apply in this part.

(p) Toy plastic or paper caps for toy pistols in sheets, strips, rolls, or individual caps, must not contain more than an average of twenty-five hundredths of a grain of explosive composition per cap and must be packed in inside packages constructed of cardboard not less than 0.013-inch in thickness, metal not less than 0.008-inch in thickness, noncombustible plastic not less than 0.015-inch in thickness, or a composite blister package consisting of cardboard not less than 0.013-inch in thickness and noncombustible plastic not less than 0.005-inch in thickness, which shall provide a complete enclosure and the mimimum dimensions of each side or end of such package shall be not less than ⅛-inch in height. The number of caps in these inside packages shall be limited so that not more than 10 grains of explosives composition shall be packed into one cubic inch of space and not exceeding 17.5 grains of the explosive composition of toy caps shall be packed in any inside container. These inner containers must be packed in outside containers as specified in § 173.109.

(q) Explosive rivets, each containing not more than 375 milligrams of explosive composition, are exempt from specification packaging and labeling requirements when packed in pasteboard or other inside boxes in securely closed strong wooden boxes, fiberboard boxes or metal containers. Each outside container must be marked "EXPLOSIVE RIVETS". No other restrictions apply in this part.

(r) Common fireworks are fireworks devices suitable for use by the public and designed primarily to produce visible effects by combustion. Some small devices designed to produce audible effects are also included in this class. The types, sizes and amount of pyrotechnic contents of these devices are limited as enumerated in this paragraph. No component, of any device listed in this paragraph, which produces or is intended to produce an audible effect shall contain pyrotechnic composition in excess of 2 grains in weight; nor shall such device or component, upon functioning, project or disperse any metal, glass or brittle plastic fragments. (Propelling or expelling charges consisting of a mixture of sulfur, charcoal, and saltpeter are not considered as designed to produce audible effects). Any new device, not enumerated in this paragraph, must be examined by the Bureau of Explosives and approved by the Director, OHMT, before being offered for transportation as Common Fireworks. Common fireworks must be in a finished state exclusive of mere ornamentation as supplied to the retail trade and must be so constructed and packed that loose pyrotechnic composition will not be present in packages in transportation. Fireworks, except articles defined in paragraphs (s) through (y) inclusive, of this section, other than common fireworks as defined in this paragraph, and those forbidden for transportation in § 173.51, are classed as Special Fireworks (see § 173.88(d)).

(1) Roman candles, not exceeding ten balls spaced uniformly in the tube, total pyrotechnic composition not to exceed twenty grams each in weight. The inside tube diameter shall not exceed ⅜ inch.

(2) Sky rockets with sticks, total pyrotechnic composition not to exceed twenty grams each in weight. The inside tube diameter shall not exceed ½ inch. The rocket sticks must be securely fastened to the tubes.

(3) Helicopter type rockets, total pyrotechnic composition not to exceed twenty grams each in weight. The inside tube diameter shall not exceed ½ inch.

(4) Cylindrical fountains, total pyrotechnic composition not to exceed seventy-five grams each in weight. The inside tube diameter shall not exceed ¾ inch.

(5) Cone fountains total pyrotechnic composition not to exceed fifty grams each in weight.

(6) Wheels, total pyrotechnic composition not to exceed sixty grams for each driver unit or two hundred and forty grams for each complete wheel. The inside tube diameter of driver units shall not exceed ½ inch.

(7) Illuminating torches and colored fire in any form, total pyrotechnic composition not to exceed one hundred grams each in weight.

(8) Dipped sticks, the pyrotechnic composition of which contains any chlorate or perchlorate shall not exceed 5 grams. Sparklers, the composition of which does not exceed 100 grams each and which contain no magnesium or magnesium and a chlorate or perchlorate, are not subject to the regulations in Parts 170-189 and 397 of this title.

(9) Mines and shells of which the mortar is an integral part, total pyrotechnic composition not to exceed forty grams each in weight.

(10) Firecrackers and salutes with casings, the external dimensions of which do not exceed one and one-half inches in length or one-quarter inch in diameter, total pyrotechnic composi-

tion not to exceed two grains each in weight.

(11) Novelties consisting of two or more devices enumerated in this paragraph when examined by the Bureau of Explosives and approved by the Director, OHMT.

(s) Igniter cord consists of textile yarns and/or a wire uniformly covered with a combustible chemical mixture, with or without additional textile or wire counterings, waterproofing or finishing coatings which, when ignited burns externally at various rates according to design. Igniter cord must be packed in strong, tight, outside fiberboard boxes or drums, wooden boxes or metal containers plainly marked "IGNITER CORD."

(t) Explosive auto alarms are tubular devices containing a small amount of explosive composition and igniting compound which is ignited by an electric spark. These devices must be so designed that they will neither burst nor cause external flame on functioning.

(u) Toy propellant devices and toy smoke devices consist of small paper or composition tubes or containers containing a small charge of slow burning propellant powder or smoke producing powder. These devices must be so designed that they will neither burst nor produce external flame on functioning. Ignition elements, if attached, must be of a design examined by the Bureau of Explosives and approved by the Director, OHMT.

(v) Oil well cartridges are tubular devices each containing not more than 350 grains of propellant powder and having no ignition device or element. Cartridges must be constructed and packed so that they will be incapable of functioning en masse as a result of exposure to external flame.

(w) Actuating cartridges, explosive, fire extinguisher or valve consist of a small metal or fiber housing containing a small amount of initiating explosive and a propellant and are used to actuate valves on remotely controlled fire extinguishers or other apparatus.

(x) Cigarette loads, trick matches, and trick noise makers, explosive, must be of type examined by the Bureau of Explosives and approved by the Director, OHMT and are described as follows:

(1) Cigarette loads consist of wooden pegs to which are affixed a small amount of explosive composition.

(2) Trick matches consist of book matches, strike anywhere matches, or strike-on-box matches which have small amounts of explosive or pyrotechnic composition affixed to the match stem just below the match head.

(3) Trick noise makers, explosive, consist of spheres containing a small amount of explosive composition.

(y) Smoke candles, smokepots, smoke grenades, smoke signals, signal flares, hand signal devices, and very signal cartridges are devices designed to produce visible effects for signal purposes. These devices must contain no bursting charges and no more than 200 grams of pyrotechnic composition each (see Note 1), exclusive of smoke composition (see Note 2), unless greater weight of composition is examined by the Bureau of Explosives and approved by the Director, OHMT.

NOTE 1: Pyrotechnic compositions (other than smoke compositions) are defined as chemical mixtures which on burning and without explosion, produce visible or brilliant displays or bright lights.

NOTE 2: Pyrotechnic smoke compositions are defined as chemical smoke producing mixtures, which on ignition burn at a controlled rate, without the production of flame and without the build-up of internal pressure that would rupture or burst the end product.

(z) Explosive release devices consist of a rod or link fitted with means for mechanical attachment to other apparatus or equipment and containing a small electrically initiated explosive charge which will break the rod or link upon functioning. These devices must be so designed that they will not function other explosive devices in the package sympathetically.

(aa) Explosive power devices, Class C, are devices designed to drive generators or mechanical apparatus by means of propellant explosives, Class B. The devices consist of a housing with a contained propellant charge and an electric igniter or squib. The devices must be of a type examined by the Bureau of Explosives and approved by the Director, OHMT for this classification.

(bb) Detonating fuzes, Class C explosives, are used in the military service to detonate high explosive bursting charges of projectiles, mines, bombs, torpedos, grenades, demolition charges, and safety and arming devices. They contain a detonator and a quantity of high explosives. Additionally they may be used by the military to transmit a detonation between two or more devices. This type detonating fuze contains either an explosive train consisting of mild detonating fuse, metal clad, igniter fuse-metal clad or similar type fuses, and any combination of one or more boosters, detonators and high explosives in a total quantity not exceeding 25 grams of explosive composition. All detonating fuzes, Class C explosives, must be made and packed so that they will not cause functioning of other fuzes, explosives, or other explosive devices if one of the fuzes detonates in a shipping container or in adjacent containers.

(cc) Mild detonating fuses, metal clad and flexible linear shaped charges, metal clad consists of a core containing not more than 2½ grains of high explosive composition per lineal foot, clad with metal either with or without a covering of tapes, yarns, plastics or waterproofing compounds. Mild detonating fuse, metal clad, and flexible linear shaped charges, metal clad, in lengths not over 26 feet and not exceeding 15 grains per lineal foot having the individual lengths separated from adjacent lengths so that mass propagation will not occur, may be shipped as Class C explosives.

(dd) Igniter fuse-metal clad consists of a base metal tube with a core of explosive igniter composition in quantity not exceeding 20 grains per foot.

(ee) Starter cartridges, jet engine, Class C, consist of a metal, plastic, and/or rubber case, each containing a pressed cylindrical block of flammable solid material and having in the top of the case a small compartment that encloses an electric squib, small amount of black powder, and/or smokeless powder which constitute an igniter. The starter cartridge is used to activate a mechanical starter for jet engines and must be of a type examined by the Bureau of Explosives and approved by the Director, OHMT, except as provided in § 173.51(a)(16) and § 173.86(a).

(ff) "Cartridge, practice ammunition" means a metal cartridge case containing a primer, a propelling charge of not more than 500 grains of propellant powder, and a solid projectile or a projectile containing a smoke spotting charge.

(gg) Detonators (§ 173.53(g)(1)), which will undergo only limited propagation in the shipping package, are classed as Class C explosives. For the purposes of this paragraph, limited propagation means that if one detonator near the center of a shipping package is exploded, the aggregate weight of explosives, excluding ignition and delay charges, in this and all additional detonators in the outside packaging that explode may not exceed 25 grams. Detonators which mass detonate in the shipping package may not be classed as Class C explosives. For the purposes of this paragraph "mass detonate" means that more than 90 percent of the devices tested in a package explode practically simultaneously.

(hh) Detonating primers (§ 173.53(g)(2)) in which the total explosive charge per unit does not exceed 25 grams, and which will undergo only limited propagation in the shipping package, are classed as Class C explosives. For the purposes of this paragraph, limited propagation means that if one detonating primer near the center of a shipping package is exploded, the aggregate weight of explosives, excluding ignition and delay charges, in this and all additional detonating primers in the outside packaging that explode may not exceed 25 grams. Detonating primers which mass detonate in the shipping package may not be classed as Class C explosives. For the purposes of this paragraph, "mass detonate" means that more than 90 percent of the devices tested in a package explode practically simultaneously.

(ii) Explosive pest control devices, class C explosives, consist of a cardboard-pasteboard type tube not exceeding 4 inches in length and 3/4 inch in diameter or a shotgun shell type having an explosive projectile. They may contain a mixture of potassium perchlorate, aluminum power, sulfur, black powder, smokeless powder or similiar pyrotechnic mixture. The component which produces the audible effect may not contain more than 40 grains of explosive composition. Devices and packaging must be of a type examined by the Bureau of Explosives or the Bureau of Mines and approved by the Director, OHMT.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[29 FR 18683, Dec. 29, 1964, as amended by 31 FR 9070, July 1, 1966. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.100, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.101 Small-arms ammunition.

(a) Small-arms ammunition must be packed in pasteboard or other inside boxes, or in partitions designed to fit snugly in the outside container, or must be packed in metal clips. The partitions and metal clips must be so designed as to protect the primers from accidental injury. The inside boxes, partitions and metal clips must be packed in securely closed strong outside wooden or fiberboard boxes or metal containers. Blank Industrial Power Load cartridges, similar to the 22 long rim-fire cartridge, may be packed in bulk in securely closed fiberboard boxes.

(b) Small-arms ammunition in pasteboard or other inside boxes, in addition to containers prescribed in paragraph (a) of this section, may be shipped when packed in the same outside container with nonexplosive and nonflammable articles; or with small-arms primers or percussion caps in quantity not to exceed 5 pounds. The weight of the small-arms ammunition packed with other articles must not exceed 55 pounds in outside fiberboard box, or 75 pounds in outside wooden box. The outside package must be a securely closed strong wooden or fiberboard container.

(c) Packages containing small-arms ammunition are excepted from the label prescribed in § 172.411 of this subchapter, but the outside of each package must be plainly marked "SMALL ARMS AMMUNITION."

(d) Each package containing cartridges loaded with an Irritating Material must, in addition to marking prescribed herein, be marked "IRRITATING AGENT" and must bear the IRRITANT label.

(e) No restrictions other than proper description, packing and marking for small-arms ammunition and additional marking and labeling for tear gas cartridges are prescribed in this part for the transportation of small-arms ammunition and tear gas cartridges.

(f) Shipments of small-arms ammunition, including broken lots which have lost their identity (lot number identification), may be shipped loosely packed in securely closed strong wooden boxes or metal boxes, in carload or truckload lots, when shipments are made by or for the Departments of the Army, Navy or Air Force of the United States Government to depots or manufacturing plants for reprocessing or demilitarization. Seriously deteriorated ammunition or ammunition damaged to the point of exposing incendiary or tracer composition, spillage of propellant powder, or ammunition with other hazardous defects must not be shipped. Each outside package must be plainly marked "SMALL-ARMS AMMUNITION."

(g) Special exceptions for certain types of small arms ammunition in the ORM-D class are provided in Subpart N of this part.

(49 U.S.C. 1803, 1804, 49 CFR 1.53, App. A to Part 1)

[29 FR 18683, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16[illegible], Apr. 15, 1976; Amdt. 173-175, 49 FR 21936, May 24, 1984]

§ 173.101a Cartridges, practice ammunition.

(a) Cartridges, practice ammunition must be packaged in pasteboard or other inside boxes, or in partitions designed to fit snugly in the outside packaging, or must be packed in metal clips. The partitions and metal clips must be so designed as to protect the primers from accidental injury. The inside boxes, partitions, and metal clips must be packaged in securely closed strong outside wooden or fiberboard boxes or metal packagings.

(1) Each package must be plainly marked "CARTRIDGES, PRACTICE AMMUNITION."

[Amdt. 173-6, 34 FR 7161, May 1, 1969]

§ 173.102 Explosive cable cutters; explosive power devices, Class C; explosive release devices, or starter cartridges, jet engine, Class C explosives.

(a) Explosive cable cutters, explosive power devices, Class C, explosive release devices, or starter cartridges, jet engine, Class C must be packed in specification containers as follows:

(1) Spec. 12H, 23F, or 23H (§§ 178.209, 178.214, or § 178.219 of this chapter). Fiberboard boxes. Authorized gross weight not to exceed 65 pounds.

(2) In addition to specification containers prescribed in this section, explosive cable cutters, explosive power devices, Class C, explosive release devices, or starter cartridges, jet engines, Class C may be shipped in strong wooden or metal boxes. Starter cartridges, jet engine, must have igniter wires short-circuited when packed for shipment.

(b) Each package must be plainly marked "EXPLOSIVE CABLE CUTTERS"; "EXPLOSIVE POWER DEVICES, CLASS C"; "EXPLOSIVE RELEASE DEVICES", or "STARTER CARTRIDGES, JET ENGINE, CLASS C EXPLOSIVES", as appropriate, and "HANDLE CAREFULLY—KEEP FIRE AWAY."

[29 FR 18683, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-6, 34 FR 7161, May 1, 1969; Amdt. 173-138, 45 FR 32695, May 19, 1980]

§ 173.103 Detonators, Class C explosives, and detonating primers, Class C explosives.

(a) It must be shown by actual tests that detonators and detonating primers which are to be offered for transportation as Class C explosives meet the appropriate definitions in paragraphs (gg) and (hh) in § 173.100. Testing must be performed or confirmed and the classification approved as specified in § 173.86. Substitution of a representative packaging in place of the actual shipping package for testing purposes may be authorized by one of the agencies specified in § 173.86(b).

(b) Detonators, Class C explosives, and detonating primers, Class C explosives, may only be offered for transportation if they are packed in packagings specified in §§ 173.66 and 173.68 that meet the requirements of paragraph (a) of this section, except that quantity limitations for devices in packagings (other than the gross weight limitation for the specification packaging used) do not apply.

(c) Detonators originally classed as Class C explosives in accordance with the requirements of paragraph (a) of this section, may be offered for transportation in an IME Standard 22 container as Class C explosives subject to the following conditions:

(1) Each detonator may contain no more than 1 gram of explosive (excluding ignition and delay charges);

(2) The detonators must be packed in accordance with the requirements and limitations of § 173.86, except paragraphs (a)(3) (ii) and (iii), and paragraph (e);

(3) There are no more than 1,000 detonators in the container; and

(4) Each inside packaging shall be marked "class C explosives".

NOTE 1: The "class C explosives" marking is the shippers certification that the contents of the IME Standard 22 container or compartment are class C explosives.

NOTE 2: Any detonator packed in an inside packaging that is not marked "class C explosives" shall be offered for transportation as a class A explosive.

(d) Detonators, Class C explosives, and detonating primers, Class C explosives, may be offered for transportation on passenger-carrying aircraft only under the following conditions:

(1) They must be packed in accordance with the applicable requirements of §§ 173.66 and 173.68 except that the maximum gross weight of any completed package may not exceed 50 pounds or the maximum gross weight permitted by the specification for the outside packaging used, whichever is less;

(2) Packages must have been tested in accordance with the requirements of paragraph (a) of this section, except

that when one device near the center of the package is detonated, no other device in the package may be caused to detonate and there must be no communication of detonation from one package to another; and

(3) The shipper certifies conformance with requirements of this paragraph by marking the outside of the package with the statement: "This package conforms to conditions and limitations specified in 49 CFR 173.103(d)".

[Amdt. 173-134, 44 FR 70731, Dec. 10, 1979, as amended by Amdt. 173-182, 50 FR 804, Jan. 7, 1985]

§ 173.104 Cord, detonating flexible; mild detonating fuse, metal clad or flexible; or flexible linear shaped charges, metal clad.

(a) Cord, detonating *flexible* which was properly examined, and classed and described "cordeau detonant fuse, class C explosive" prior to January 1, 1985 by an agency listed in § 173.86(b) is reclassed class A explosive and assigned the proper shipping name "cord, detonating *flexible*". However, until June 30, 1986, cord detonating *flexible* which was properly examined, and classed and described "cordeau detonant fuse, class C explosive" may be offered for transportation and transported subject to conditions of the approval and in accordance with requirements of this subchapter in effect on December 31, 1984.

(b) Cord, detonating *flexible;* mild detonating fuse, metal clad or flexible; and flexible linear shaped charges, metal clad may not be packed in the same package with detonators or with any high explosive.

(c) Cord, detonating *flexible;* mild detonating fuse, metal clad or flexible; and flexible linear shaped charges, metal clad shall be packed in wooden or fiberboard boxes. Each package shall be marked "CORD, DETONATING *FLEXIBLE*—HANDLE CAREFULLY", "MILD DETONATING FUSE, METAL CLAD *or* FLEXIBLE—HANDLE CAREFULLY" or "FLEXIBLE LINEAR SHAPED CHARGES, METAL CLAD—HANDLE CAREFULLY", as appropriate.

[Amdt. 173-182, 50 FR 804, Jan. 7, 1985]

§ 173.105 Percussion, tracer, combination, time fuzes and tracers.

(a) Percussion, tracer, combination, time fuzes and tracers must be packed in strong, tight, outside wooden boxes or Spec. 23F (§ 178.214 of this subchapter) fiberboard boxes, with special provision for securing individual packages of fuzes or tracers against movement in the box.

(b) The gross weight of one outside wooden box must not exceed 150 pounds, and the gross weight of one outside fiberboard box must not exceed 65 pounds.

(c) Each outside container must be plainly marked with proper descriptive name and also "HANDLE CAREFULLY".

(d) No restrictions other than proper description, packing, and marking are prescribed in this part for the transportation of percussion, tracer, time, or combination fuzes, or tracers.

[29 FR 18683, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16066, Apr. 15, 1976]

§ 173.106 Cartridge bags, empty, with black powder igniters, igniters, safety squibs, electric squibs, delay electric igniters, igniter fuse-metal clad, and fuse lighters or fuse igniters.

(a) Cartridge bags, empty, with black powder igniters, igniters, safety squibs, electric squibs, delay electric igniters, igniter fuse-metal clad, and fuse lighters or fuse igniters must be packed in strong fiberboard or wooden boxes or wooden or metal barrels or drums properly described and properly marked with the name of the article packed therein.

§ 173.107 Primers, percussion caps, and grenades, empty, primed.

(a) Primers (cannon, combination and small arms), percussion caps, and empty grenades, primed, must be packed in strong, tight, outside wooden boxes, except as otherwise provided herein, with special provision for securing individual packages against movement in the box.

(b) [Reserved]

(c) Small-arms primers containing anvils must be packed in cellular inside packages, with partitions separating the layers and columns of the primers, so that the explosion of a portion of the primers in the completed shipping package will not cause the explosion of all the primers. They must be packed as prescribed in paragraphs (a) of this section or in Spec. 12B (§ 178.205 of this subchapter) fiberboard boxes, and equipped with corrugated fiberboard liners having Mullen or Cady test equal to or exceeding that of the box, except liner is not required for full depth telescope style box which may be closed as specified by § 178.205-17(a)(2) of this subchapter. Not more than 5,000 primers shall be packed in each fiberboard box.

(1) Spec. 23H (§ 178.219 of this subchapter). Fiberboard boxes of full depth telescope style with top section having extended end flaps and bottom section with extended side flaps designed to tuck under and form boxes without glued or stapled joints. Boxes shall have full height inside perimeter liner and top and bottom full area pads of double-wall corrugated fiberboard. Hand-holes oval in shape, not more than 1 inch in width by 4 inches in length and horizontal with top score line, are authorized in ends of boxes. Primers shall be packed in cellular inside packages with partitions separating the layers and columns of the primers as required by the introductory text of this paragraph. Not more than 50,000 primers shall be packed in one outside box.

(d) Percussion caps must be packed in metal or other inside boxes containing not more than 500 caps; the construction of the cap or packing and the kind and quantity of explosives in each must be such that the explosion of a part of the caps in the completed shipping package will not cause the explosion of all the caps.

(1) Specification 12B (§ 178.205 of this subchapter). Fiberboard box. Caps must be packed in inside metal cans containing not more than 100 caps each. Can must then be packed in a chipboard box with not more than 10 cans per box. Not more than 5 chipboard boxes shall be packed in the 12B fiberboard box. The completed package must be such that the explosion of a part of the caps will not cause the explosion of all the caps.

(2) Specification 12B (§ 178.205 of this subchapter). Fiberboard box. Caps must be packed in inside plastic cans containing not more than 100 caps each. Cans must then be packed in a chipboard box with not more than 8 such chipboard boxes packed tightly in the 12B fiberboard box. The completed package must be such that the explosion of part of the caps will not cause the explosion of all of the caps.

(e) Small-arms primers and/or percussion caps may be packed with nonexplosive and/or nonflammable articles, or with small-arms ammunition as provided in § 173.101(b). Small-arms primers may be included with propellant explosives (solid), class B, in the same outside container as provided in § 173.93(g)(1). The weight of the small-arms primers or percussion caps must not exceed 5 pounds in any such outside container.

(f) The gross weight of one outside package must not exceed 150 pounds.

(g) Each outside container must be plainly marked with proper descriptive name and also "HANDLE CAREFULLY"

(h) No restrictions other than proper shipping name, packaging and marking are prescribed in this subpart for the transportation of those materials named in paragraph (a) of this section.

[29 FR 18683, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

Editorial Note: For Federal Register citations affecting § 173.107, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.108 Common fireworks, signal flares, hand signal devices, smoke signals, smoke candles, smoke grenades, smoke pots, and Very signal cartridges.

(a) Class C explosives covered by this section must, unless otherwise specifically provided for, be securely packed in packages complying with the following specifications.

(1) [Reserved]

(2) Specification 15A, 15B, 16A, 19A, or 19B (§ 178.168, § 178.169, § 178.185, § 178.190, or § 178.191 of this subchapter). Wooden boxes. Gross weight not

to exceed 100 pounds, except gross weight of 500 pounds is authorized for Very signal cartridges only.

(3) Spec. 12B (§ 178.205 of this subchapter) Fiberboard boxes. Gross weight not to exceed 65 pounds.

(4) Firecrackers, Chinese, in addition to containers specified in paragraph (a) (1), (2), and (3) of this section, may also be transported in the package in which they are imported, provided these packages consist of wooden boxes, or fiberboard boxes, spec. 12B (§ 178.205 of this subchapter), in good condition, completely covered with strong matting and do not weigh more than 100 pounds, gross.

(5) Fireworks, such as sparklers, with match tip or head, or similar ignition point or surface, must have each individual tip, head, or similar ignition point or surface entirely covered and securely protected against accidental contact or friction.

(6) Signal flares may be packed with nonexplosive or nonflammable articles provided the outside packages are marked as prescribed in this section.

(b) [Reserved]

(c) Except as otherwise specified herein the gross weight of one outside package containing common fireworks must not exceed 100 pounds.

(d) Each outside package must be plainly marked in letters not less than seven-sixteenths of an inch in height "Common Fireworks," "Signal Flares," "Hand Signal Devices," "Smoke Signals," "Smoke Candles," "Smoke Pots," "Smoke Grenades," or "Very Signal Cartridges," as appropriate, and with the additional words "Handle Carefully—Keep Fire Away."

[29 FR 18683, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-56, 36 FR 21201, Nov. 4, 1971; Amdt. 173-81, 39 FR 17316, May 15, 1974; Amdt. 173-94, 41 FR 16066, Apr. 15, 1976; Amdt. 173-149, 46 FR 49893, Oct. 8, 1981]

§ 173.109 Toy caps.

(a) Toy caps must be packed in containers complying with the following specifications:

(1) Specification 15A, 15B, 16A, 19A or 19B (§§ 178.168, 178.169, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes. Gross weight not to exceed 150 pounds.

(2) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes. Gross weight not to exceed 65 pounds.

(3) Toys caps, in addition to containers specified in paragraphs (a) (1) and (2) of this section, may be transported in the package in which they are imported, provided the package consists of a wooden box, metal-lined, in good condition, and weighing not over 100 pounds gross. Inside packages must be as defined in § 173.100(p).

(b) Toy caps may be packed with nonexplosive or nonflammable articles provided the outside containers are marked as prescribed herein.

(c) Toy paper caps of any kind must not be packed with fireworks.

(d) Each outside container must be plainly marked "TOY CAPS—HANDLE CAREFULLY".

[29 FR 18683, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16066, Apr. 15, 1976; Amdt. 173-149, 46 FR 49894, Oct. 8, 1981]

§ 173.110 Charged well casing jet perforating guns, total explosive content in guns not exceeding 20 pounds per motor vehicle.

(a) Charged well casing jet perforating guns transported by motor vehicles operated by private carriers engaged in well operations in which the total weight of the explosive contents of shaped charges assembled to guns being transported does not exceed 20 pounds per such vehicle must be packed as prescribed in § 173.80(b), (c), (d) and (e).

(b) Charged well casing jet perforating guns may be offered for transportation and transported only by private carrier by highway.

(c) Charged well casing jet perforating guns may be offered for transportation and transported by private offshore well supply vessels only when carried in special motor vehicles as prescribed in § 173.80 or on offshore down hole tool pallets provided that:

(1) No blasting caps, electric blasting caps or other firing devices shall be affixed or installed in the guns;

(2) Each shaped charge shall contain not over 4 ounces of explosives;

(3) Each shaped charge, if not completely enclosed in glass or metal,

shall be fully protected by a metal cover after installation in the gun; and

(4) The total weight of the explosive contents of shaped charges assembled in guns being carried does not exceed 20 pounds per vehicle or pallet. Each cargo vessel compartment may contain up to 20 pounds of explosive content if the segregation requirements of § 176.83(b)(3) are met. More than one pallet or vehicle, each containing not more than 20 pounds of explosive content, may be stowed "on deck" provided a minimum horizontal separation distance of 10 feet is provided.

[29 FR 18683, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-165, 48 FR 28101, June 20, 1983]

§ 173.111 Cigarette loads, explosive auto alarms, toy propellant devices, toy smoke devices, trick matches, and trick noise makers, explosive.

(a) Cigarette loads, explosive auto alarms, toy propellant devices, toy smoke devices, trick matches, and trick noise makers, explosive must be packed in specification containers as follows:

(1) Specification 15A, 15B, 16A, 19A or 19B (§§ 178.168, 178.169, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes. Gross weight not to exceed 150 pounds.

(2) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes. Gross weight not to exceed 65 pounds.

(3) Each outside container must be plainly marked with the proper descriptive name and "HANDLE CAREFULLY".

[29 FR 18683, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16066, Apr. 15, 1976; Amdt. 173-149, 46 FR 49894, Oct. 8, 1981]

§ 173.112 Oil well cartridges.

(a) Oil well cartridges must be so packed that the explosive composition does not exceed 20 grains per cubic inch of space in the outside shipping container and must be in specification containers as follows:

(1) Specification 15A, 15B, 16A, 19A or 19B (§§ 178.168, 178.169, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes. Gross weight not to exceed 150 pounds.

(2) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes. Gross weight not to exceed 65 pounds.

(3) Each outside container must be plainly marked with the name "Oil Well Cartridge" and "HANDLE CAREFULLY".

[29 FR 18683, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16066, Apr. 15, 1976; Amdt. 173-149, 46 FR 49894, Oct. 8, 1981]

§ 173.113 Detonating fuzes, Class C explosives.

(a) Detonating fuzes, Class C explosives, must be packed in specification containers as follows:

(1) Specification 12H (§ 178.209 of this subchapter). Fiberboard boxes either without liners with well secured inside pasteboard cartons or with suitable filler or lining material to prevent movement in the box.

(2) In addition to specification containers prescribed in this section, detonating fuzes, Class C explosive, may be packed in well secured strong, tight outside wooden or metal boxes. The gross weight of the outside wooden or metal box must not exceed 190 pounds.

(b) Each outside package must be plainly marked "DETONATING FUZES, CLASS C EXPLOSIVES—HANDLE CAREFULLY".

[29 FR 18683, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16066, Apr. 15, 1976; Amdt. 173-111, 42 FR 58937, Nov. 14, 1977]

§ 173.114 Actuating cartridges, explosive, fire extinguisher or valve.

(a) Actuating cartridges, explosive, fire extinguisher or valve must be packed in strong wooden or fiberboard boxes.

(b) Each outside container must be plainly marked "ACTUATING CARTRIDGES EXPLOSIVE, FIRE EXTINGUISHER—HANDLE CAREFULLY" or "ACTUATING CARTRIDGES, EXPLOSIVE, VALVE—HANDLE CAREFULLY".

(c) When shipped as components with fire extinguisher or with valve and with not more than 2 cartridges for each extinguisher or valve, they are exempt from Parts 170-189 of this subchapter.

§ 173.114a Blasting agents.

(a) *Definition of a blasting agent.* A blasting agent is a material designed for blasting which has been tested in accordance with paragraph (b) of this section and found to be so insensitive that there is very little probability of accidental initiation to explosion or of transition from deflagration to detonation.

(b) *Tests.* Except as provided in paragraph (c) of this section, no material may be offered for transportation described or classed as a blasting agent unless it passes the following tests:

(1) *Blasting cap sensitivity test.* (i) The container used for the blasting agent sample must be cylindrical, having a diameter of 3⅜ inches and a length of 6⅜ inches. The container must provide essentially no confinement.

(ii) The container must be filled with the sample. Solid materials must be packed to the same filling density as they will be packed in the shipping container. The temperature of the sample must be between 70°F. and 75°F. If it is difficult to achieve an appropriate filling density in the test container, e.g., auger packed products, it may be necessary to auger fill a special container for the test.

(iii) The filled container must be placed on a solid lead cylinder 4 inches long by 2 inches in diameter which must, in turn, be placed upright on a firm surface.

(iv) A commerical No. 8 fuse blasting cap or electric blasting cap must be inserted in the center of the top of the sample for the full length of the cap. A No. 8 commercial cap means a cap which contains 0.40-.45 grams of pentaerythrite tetranitrate (PETN) base charge pressed into an aluminum shell with bottom thickness not to exceed 0.03 inch to a specific gravity of not less than 1.4 grams per cubic centimeter and primed with standard weights of primer, in accordance with the manufacturer's specifications.

(v) The blasting cap must be initiated from a safe position.

(vi) If the lead block is compressed ⅛-inch or more, the material is considered to have detonated.

(vii) The test must be conducted three times or until detonation occurs, whichever occurs first.

(viii) A material which detonates in any trial may not be classed as a blasting agent.

(2) *Differential thermal analysis test.* (i) This test must be conducted using a standard, commercially produced, differential thermal analysis instrument or a laboratory constructed apparatus which gives comparable results.

(ii) The portion of the blasting agent tested must be representative of the complete mixture.

(iii) The test must be conducted three times. If the first exotherm exhibited by the material in any trial is less than 212° F. (100° C.), it may not be classed as a blasting agent.

(3) *Thermal stability test.* (i) At least 50 grams of the material must be placed in a loosely covered glass vessel and mantained at 167° F. (75° C.) for 48 consecutive hours.

(ii) A material which ignites or evidences decomposition by fumes, discoloration, or other characteristics may not be classed as a blasting agent.

(4) *Electrostatic sensitivity test.* (i) The apparatus must be designed so that an electrostatic spark can be caused to jump from a pointed electrode to a metal plate which also serves as a sample holder.

(ii) Ten milligrams of material must be used for each test. The portion of the blasting agent tested must be representative of the complete mixture.

(iii) If the test portion flames, smolders, or glows from the spark, the materials is considered to have ignited.

(iv) The test must be conducted three times or until ignition occurs, whichever occurs first.

(v) A material which ignites in any trial when exposed to a spark of 0.006 joules delivered from a 0.002 to 0.004 micro-farad capacitor may not be classed as a blasting agent.

(5) *Impact sensitivity test.* (i) Impact tests must be conducted in a Bureau of Explosives Impact Apparatus. (See § 173.53, Note 4.)

(ii) The tests must be run on ten milligram samples. The test portions must be representative of the complete mixture.

(iii) The drop height used in all trials must be ten inches.

(iv) The test must be conducted ten times or until an explosion occurs, whichever occurs first. An explosion is evidenced by flame or flame and noise. The production of smoke alone is not evidence of explosion.

(v) A material which explodes in any trial may not be classed as a blasting agent.

(6) *Fire test.* (i) The largest package [not to exceed 200 kg (440 lbs.)] of each type to be offered for transportation must be placed on incombustible supports and subjected to a fire.

(ii) The fuel used may be kerosene-soaked wood, flammable or combustible liquid, or flammable gas.

(iii) The fire shall be large enough to engulf the bottom of the package. The flames must reach at least halfway up on all sides.

(iv) The duration of the fire must be such as to cause the material in the package to burn or fume off completely, except for substances such as the oxides of aluminum or iron which are incombustible.

(v) Explosion is evidenced by a loud noise and the projection of fragments from the fire area.

(vi) Any material which explodes in this test may not be classed as a blasting agent.

(c) A material containing no ingredients, other than prilled ammonium nitrate and fuel oil, need only pass the test specified in paragraph (b)(1) of this section to be classed as a blasting agent. If a material classed as a blasting agent is offered for transportation under the test exception of this paragraph, it must be described as "ammonium nitrate-fuel oil mixture."

(d) *Notification and approval.* Except as provided in paragraphs (e) and (f) of this section, approval by the Director, Office of Hazardous Materials Transportation (OHMT) is required for materials classed as blasting agents produced by a person who:

(1) Has not previously produced that blasting agent; or

(2) Has previously produced the blasting agent but has made a change in the formulation, process, or components. A blasting agent is not required to be approved by the Director, OHMT if an agency listed in paragraph (d)(3) of this section has determined and confirmed in writing to the Director, OHMT that there are no significant differences in hazard characteristics relative to a blasting agent previously approved by the Director, OHMT.

(3) No person may offer a blasting agent for transportation unless it has been examined by the Bureau of Explosives or Bureau of Mines, U.S. Department of the Interior and classed and approved by the Director, OHMT; or examined, classed, and approved by one of the following agencies:

(i) U.S. Department of Energy (DOE) for blasting agents made by, or under the direction or supervision of DOE; or

(ii) U.S. Army Materiel Development and Readiness Command (DRCSF), Naval Sea Systems Command (NAVSEA 06H) or HQUSAF (IGD/SEV) for blasting agents made by, or under the direction or supervision of the DOD.

(4) Except as otherwise provided in this section, each person who offers a blasting agent for transportation must submit a copy of the tentative class accompanied by a supporting laboratory report or equivalent data to, and receive a written approval from, the Director, OHMT prior to offering the blasting agent for transportation.

(e) For each mixture of a blasting agent containing only prilled ammonium nitrate and fuel oil classed in accordance with paragraph (c) of this section, a copy of the test report on which the class is based must be filed with the Director, OHMT before the material is offered for transportation and a copy of the report retained as long as that formulation is in use. As a minimum, the test report must contain the name and address of the person or organization conducting the test, date of test, quantitative composition of the mixture, including prill size and porosity, and a description of test results.

(f) Samples of materials designed for blasting not previously approved may be offered for transportation to a testing facility for examination if:

(1) The material has been assigned a tentative description and class in writing by one of the agencies listed in paragraph (d)(3) of this section.

(2) The material is packaged as required by this part according to the tentative description and class assigned.

(3) The package is labeled as required by this subchapter and the following is marked on the package:

(i) The words "SAMPLE FOR LABORATORY EXAMINATION";

(ii) The net weight of material; and

(iii) The tentative shipping description.

(g) A material designed for blasting that has not been examined or approved may be transported from where it was produced to an explosive testing facility under the following conditions:

(1) The material is not a forbidden explosive or an initiating explosive according to this subchapter;

(2) The material must be described as high explosive or high explosive, liquid, as appropriate and packed, marked, labeled, and described on the shipping paper as required by this subchapter;

(3) The material is transported in a motor vehicle operated by the owner of the material; and

(4) The shipment is accompanied by a person, in addition to the driver of the motor vehicle, who is qualified by training and experience to handle the blasting material.

(h) *Packaging for blasting agents.* Each package of blasting agent when prepared for shipment must comply with the applicable requirements of § 173.24 and withstand one of the following tests:

(1) Rigid packages (e.g., boxes and drums), prepared as for shipment, must be capable of withstanding a four-foot drop onto solid concrete so as to strike the most vulnerable point on the package without rupture or any loss of contents.

(2) Non-rigid packages (e.g., tubes and bags), prepared as for shipment, must be capable of withstanding three four-foot drops onto solid concrete without rupture or any loss of contents.

(3) Blasting agents may not be transported in portable tanks, cargo tanks, or tank cars except in accordance with the terms of specific exemptions issued by the Office of Hazardous Materials Transportation.

(i) See §§ 174.83, 176.83 and 177.848 of this subchapter for loading requirements.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 173-124, 44 FR 31182, May 31, 1979, as amended by Amdt. 173-146, 46 FR 22195, Apr. 16, 1981; Amdt. 173-158, 47 FR 43065, Sept. 30, 1982; Amdt. 173-16, 48 FR 50460, Nov. 1, 1983]

Subpart D—Flammable, Combustible, and Pyrophoric Liquids; Definitions and Preparation

§ 173.115 Flammable, combustible, and pyrophoric liquids; definitions.

(a) *Flammable liquid.* (1) For the purposes of this subchapter a flammable liquid means any liquid having a flash point below 100° F. (37.8° C.), with the following exceptions:

(i) Any liquid meeting one of the definitions specified in § 173.300;

(ii) Any mixture having one component or more with a flash point of 100° F., (37.8° C.) or higher, that makes up at least 99 percent of the total volume of the mixture;

(2) For the purposes of this subchapter, a distilled spirit of 140 proof or lower is considered to have a flash point no lower than 73° F.

(b) *Combustible liquid.* (1) For the purposes of this subchapter, a combustible liquid is defined as any liquid that does not meet the definition of any other classification specified in this subchapter and has a flash point at or above 100° F. (37.8° C.) and below 200° F. (93.3° C.) except any mixture having one component or more with a flash point at 200° F. (93.3° C.) or higher, that makes up at least 99 per cent of the total volume of the mixture.

(2) For the purposes of this subchapter:

(i) An aqueous solution containing 24 percent or less alcohol by volume is considered to have a flash point of no less than 100° F. (37.8° C) if the remainder of the solution is not subject to this subchapter, and

(ii) An aqueous solution containing 24 percent or less alcohol by volume is not subject to the requirements of this subchapter if it contains no less than 50 percent water and no material (other than the alcohol) which is subject to this subchapter.

(3) 200° F. (93.3° C) is a limitation of the application of the regulations in this subchapter and should not be construed as indicating that liquids with higher flash points will not burn. Markings such as "NONFLAMMABLE" or "NONCOMBUSTIBLE" should not be used on a vehicle containing a material that has a flash point of 200° F. (93.3° C.) or higher.

(c) *Pyrophoric liquids.* (1) For the purposes of this subchapter, a pyrophoric liquid is any liquid that ignites spontaneously in dry or moist air at or below 130° F. (54.5° C.).

NOTE 1: The Bureau of Explosives is equipped to test samples of flammable liquids to determine whether or not they are pyrophoric.

(d) *Flash point.* (1) "Flash point" means the minimum temperature at which a liquid gives off vapor within a test vessel in sufficient concentration to form an ignitable mixture with air near the surface of the liquid and shall be determined as follows:

(i) For a homogeneous, single-phase, liquid having a viscosity less than 45 S.U.S. at 100° F. (37.8° C) that does not form a surface film while under test, one of the following test procedures shall be used:

(A) Standard Method of Test for Flash Point by Tag Closed Tester, (ASTM D56-79); or

(B) Standard Methods of Test for Flash Point of Liquids by Setaflash Closed Tester, (ASTM D3278-78).

(ii) For a liquid other than one meeting all of the criteria of paragraph (d)(1)(i) of this section, one of the following test procedures shall be used:

(A) Standard Method of Test for Flash Point by Pensky-Martens Closed Tester, (ASTM D93-80). For cutback asphalt, use Method B of ASTM 93-80. (Alternate tests authorized in this standard may be used); or

(B) Standard Methods of Test for Flash Point of Liquids by Setaflash Closed Tester, (ASTM D3278-78).

(2) For a liquid that is a mixture of compounds that have different volatility and flash points, its flash point shall be determined as specified in paragraph (d)(1) of this section, on the material in the form in which it is to be shipped. If it is determined by this test that the flash point is higher than 20° F. (−6.67° C.) a second test shall be made on a sample of the liquid evaporated from an open beaker (or similar container), under ambient pressure and temperature (20 to 25° C.) conditions, to 90 percent of its original volume or for a period of 4 hours, whichever comes first. The lower flash point of the two tests shall be the flash point of the material.

(3) For flash point determinations by Setaflash closed tester, the glass syringe specified need not be used as the method of measurement of the test sample if a minimum quantity of 2 milliliters is assured in the test cup.

(e) "S.U.S." means Saybalt Universal Seconds as determined by the Standard Method of Test for Saybolt Viscosity (ASTM D88-56) (reapproved 1968) and may be determined by use of the S.U.S. conversion tables specified in the Standard Method for Conversion of Kinematic Viscosity to Saybolt Universal Viscosity or to Saybolt Furol Viscosity ASTM D2161-79 following determination of viscosity in accordance with the Standard Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (and the Calculation of Dynamic Viscosity) (ASTM D445-79).

(f) [Reserved]

(g) If experience or other data indicate that the hazard of a material is greater or less than indicated by the criteria specified in paragraphs (a), (b), and (c) of this section, the Department may revise its classification or make the material subject to the requirements of Parts 170-189 of this subchapter.

[Amdt. 173-78A, 40 FR 22264, May 22, 1975, as amended by Amdt. 173-94, 41 FR 16066, Apr. 15, 1976; Amdt. 173-158, 47 FR 43065, Sept. 30, 1982; Amdt. 173-165, 48 FR 28101, June 20, 1983]

§ 173.116 Outage.

(a) Outage for packings of flammable liquids offered for transportation, except as otherwise provided in this part, must be as prescribed in paragraphs (b) to (h) of this section.

(b) Packagings must not be completely filled. For packagings of a capacity of 110 gallons or less, sufficient outage must be provided so that the packaging will not be liquid full at 130° F. (55° C).

(c) [Reserved]

(d) Flammable liquids must not be loaded into domes of tank cars. If the dome of the tank car does not provide sufficient outage, then vacant space must be left in the shell to make up the required outage.

(e) Flammable liquids having vapor pressure of 16 pounds per square inch absolute at 100° F. or less must be so loaded in tank cars that the outage shall be not less than 2 percent.

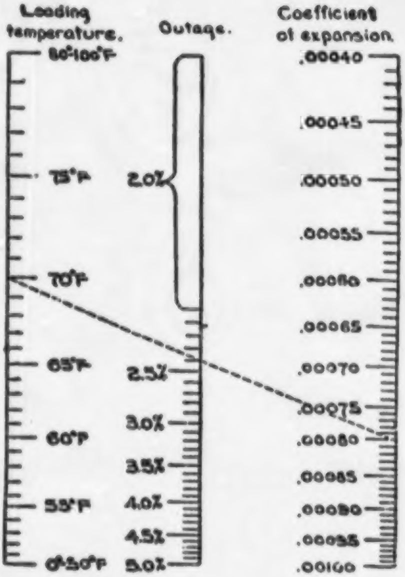
(f) Flammable liquids having a vapor pressure exceeding 16 pounds per square inch absolute at 100° F. for which minimum outage is not otherwise specifically provided herein, when loaded in uninsulated tank cars, must be so loaded that the minimum outage will be the greatest of the following values:

(1) Dome capacity.

(2) Two percent of total capacity of tank and dome.

(3) Outage as shown in paragraph (g) of this section.

(g) Outage chart for flammable liquids loaded in uninsulated tank cars:



(1) Example: Suppose the temperature of the liquid at time of loading is 70° F. and its coefficient of expansion is 0.00080; lay a ruler on the chart running from 70° to 0.00080 as shown by the dotted line and the required outage is 2.4 percent where the ruler crosses the outage scale.

The following coefficients of expansion per degree Fahrenheit, of the principal flammable liquids shall be used in determining outages:

Acetone	0.00085
Amyl acetate	.00068
Benzol (benzene)	.00071
Carbon bisulfide	.00070
Ether	.00098
Ethyl acetate	.00079
Ethyl (grain) alcohol	.00062
Methyl (wood) alcohol	.00072
Toluol (toluene)	.00063
Gasoline or naphthe:	
50–55° A.P.I.[1]	.00055
55.1–60° A.P.I.[1]	.00060
60.1–65° A.P.I.[1]	.00065
65.1–70° A.P.I.[1]	.00070
70.1–75° A.P.I.[1]	.00075
75.1–80° A.P.I.[1]	.00080
80.1–85° A.P.I.[1]	.00085
85.1–90° A.P.I.[1]	.00090

[1] A.P.I. (American Petroleum Institute), according to the following formula:
°A.P.I. = (141.5/specific gravity) − 131.5

(h) No cargo tank or compartment thereof used for the transportation of any flammable liquid shall be liquid full. The vacant space (outage) in a cargo tank or compartment thereof used in the transportation of flammable liquids shall be not less than 1 percent; sufficient space (outage) shall be left vacant in every case to prevent leakage from or distortion of such tank or compartment by expansion of the contents due to rise in temperature in transit.

[29 FR 18700, Dec. 29, 1964, as amended by Order 67, 30 FR 7420, June 5, 1965. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16066, Apr. 15, 1976; Amdt. 173-94B, 41 FR 57069, Dec. 30, 1976]

§ 173.117 Closing and cushioning.

(a) All containers must be tightly and securely closed. Inside containers must be cushioned as prescribed, or in any case when necessary to prevent breakage or leakage.

[29 FR 18701, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

§ 173.118 Limited quantities of flammable liquids.

(a) Limited quantities of flammable liquids that do not meet the definition of another hazard class in this subchapter and for which exceptions are permitted as noted by reference to this section in § 172.101 of this subchapter, are excepted from labeling (except when offered for transportation by air) and specification packaging requirements of this subchapter when packed according to the following paragraphs. In addition, shipments are not subject to Subpart F of Part 172 of this subchapter, to Part 174 of this subchapter except § 174.24 and to Part 177 of this subchapter except § 177.817.

(1) In metal containers not over 1 quart capacity each, packed in strong outside containers,

(2) In containers having a capacity not over 1 pint or 16 ounces by weight each, packed in strong outside containers, or

(3) In inside containers having a rated capacity of one gallon or less when packed in strong outside containers. The provisions of this partial exemption apply only if the flash point of the material is 73° F. or higher and the flash point, or an indication that the flash point is 73° F. or higher is marked on the outside package.

(b) A flammable liquid that does not meet the definition of another hazard class and has a flash point of 73° F. or higher is not subject to the specification packaging requirements of this part when in packagings of 110 gallons or less. The provisions of this paragraph apply only if the flash point, or an indication that its flash point is 73° F. or higher, is marked on the outside package. Notwithstanding § 172.101 of this subchapter, the net quantity limitation for flammable liquids meeting the conditions of this paragraph is one gallon per package for carriage aboard passenger-carrying aircraft or railcar, and 55 gallons per package for carriage aboard cargo aircraft only.

(c) Alcoholic beverages (wine and distilled spirits as defined in 27 CFR 4.10 and 5.11) in containers having a rated capacity of one gallon or less are not subject to the requirements of this subchapter.

(d) Special exceptions for shipment of certain flammable liquids in the ORM-D class are provided in Subpart N of this part.

[Amdt. 173-78A, 40 FR 22264, May 22, 1975, as amended by Amdt. 173-94, 41 FR 16066, Apr. 15, 1976; Amdt. 173-94A, 41 FR 40681, Sept. 20, 1976; Amdt. 173-135, 45 FR 13090, Feb. 28, 1980; Amdt. 173-16, 48 FR 50461, Nov. 1, 1983]

§ 173.118a Exceptions for combustible liquids.

(a) Unless otherwise stated for a specific material, the regulations in this subchapter do not apply to a material classed as a combustible liquid in a packaging having a rated capacity of 110 gallons or less, unless the combustible liquid is a hazardous substance, or a hazardous waste.

(b) A combustible liquid that is a hazardous substance or a hazardous waste in a packaging having a rated capacity of 110 gallons or less, and a combustible liquid in a portable tank, cargo tank or tank car is not subject to the requirements of this subchapter except those pertaining to:

(1) Shipping papers, waybills, switching orders, and hazardous waste manifests;

(2) Marking of portable tanks and marking of packages having a rated capacity of 110 gallons or less that contain hazardous substances or hazardous wastes;

(3) Display of identification numbers on portable tanks, cargo tanks, tank cars and multi-unit tank car tanks;

(4) Placarding of portable tanks, cargo tanks and tank cars;

(5) Carriage aboard aircraft and vessels (for packaging requirements for transport by vessel see § 176.340 of this subchapter); and,

(6) Reporting incidents as prescribed by §§ 171.15, 171.16 and 171.17 of this subchapter.

[Amdt. 173-137, 45 FR 34703, May 22, 1980, as amended by Amdt. 173-137, 45 FR 74669, Nov. 10, 1980; Amdt. 173-144, 46 FR 9893, Jan. 29, 1981; 46 FR 24184, Apr. 30, 1981]

§ 173.119 Flammable liquids not specifically provided for.

(a) *Flammable liquids with flash point 20° F. or below.* Flammable liquids with flash point 20° F. or below and having vapor pressure (Reid[1] test) not over 16 pounds per square inch, absolute, at 100° F., other than those for which special requirements are prescribed in this part, must be prepared for shipment in specification containers of a design and constructed of materials that will not react dangerously with or be decomposed by the chemical packed therein as required in the following paragraphs (see paragraphs (c) to (i) of this section for high pressure liquids, paragraphs (j) to (l) of this section for viscous liquids, and paragraph (m) of this section for flammable liquids which are also oxidizers, radioactive material, corrosive liquids, poison B liquids, or organic peroxides and § 173.134 for flammable liquids that are also pyrophoric liquids):

(1) Specification 1A, 1D, or 1M (§§ 178.1, 178.4, 178.17 of this subchapter). Glass carboys in boxes or expanded polystyrene packagings. Rated capacity may not exceed 5 gallons for Specification 1A. Not authorized for transportation by aircraft.

(2) Spec. 5, 5A, 5B, 5C, or 5M §§ 178.80, 178.81, 178.82, 178.83, or § 178.90 of this subchapter). Metal barrels or drums, with openings not exceeding 2.3 inches in diameter.

(3) Specification 17E (§ 178.116 of this subchapter). Metal drums (single-trip) with openings not over 2.3 inches in diameter. Drums with a marked capacity of more than 5 gallons but not more than 30 gallons must be constructed of 19-gauge body and head sheets. Drums with a marked capacity in excess of 30 gallons must be constructed of 18-gauge body and head sheets. Drums with a marked capacity of more than 5 gallons are not authorized for transportation by air.

(4) Spec. 17C (§ 178.115 of this subchapter). Metal drums (single-trip), with openings not exceeding 2.3 inches in diameter.

(5)-(6) [Reserved]

(7) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes with inside containers which must be glass or earthenware, not over 1 quart each; metal cans not over 1 gallon each.

NOTE 1: Spec. 12B fiberboard boxes (§ 178.205-26(a) of this subchapter), with one inside rectangular metal can, spec. 2F (§ 178.25 of this subchapter) not to exceed 5 gallons capacity, are authorized for gasoline only. Gross weight of completed package not over 65 pounds.

(8) Spec. 15A, 15B, 15C, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, or § 178.191 of this subchapter.) Wooden boxes with inside containers which must be metal pails, kits, or cans, not over 10 gallons each or inside glass or earthenware containers not over 1 gallon each, except that glass or earthenware containers up to 3 gallons each are authorized when only one inside container is packed in each outside container.

(9) Spec. 21C, 22A or 22B (§ 178.224, § 178.196 or § 178.197 of this subchapter). Fiber drums and plywood drums with a single inside glass, earthenware, or metal container of not over one gallon capacity in each drum. Inside container must be so cushioned at top, sides, and bottom, as to prevent breakage or leakage in transit.

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[1] ASTM Test D323.

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(10) Specification 42B, (§ 178.107, of this subchapter). Aluminum drums.

(11) Cylinders as prescribed for any compressed gas, except acetylene.

(12) Specification 103,[2] 103W, 103ALW, 103DW, 104,[2] 104W, 105A100,[2] 105A100ALW, 105A100W, 106A500X, 106A800XNC, 106A800NCI,[2] 109A100ALW, 109A300W, 110A500W, 111A60ALW1, 111A60F1, 111A60W1, 111A100W3, 111A100W4, 111A100W6, 112A200W, 112A400F, 114A340W, 115A60W1, 115A60ALW, or 115A60W6, (§§ 179.100, 179.101, 179.200, 179.201, 179.220, 179.300, 179.301 of this subchapter) tank cars. For cars equipped with expansion domes, manway closures must be so designed that pressure will be released automatically by starting the operation of removing the manway cover. Openings in tank heads to facilitate application of lining are authorized on tank cars constructed before January 1, 1975. These openings must be closed in an approved manner (§ 179.3 of this subchapter).

(13) The use of spec. 103AL special riveted aluminum tank cars is authorized for the transportation of gasoline, ethyl acetate, acetone, methanol, or butyraldehyde as provided in special orders of November 5, 1937 and February 1, 1939.

(14) Spec. 15X (§ 178.181 of this subchapter). Wooden boxes with inside metal containers. For shipment by common carriers by water to noncontiguous territories or possessions of the United States and foreign countries; shipments from inland points in the United States which are consigned to such destinations are authorized to be transported to ship side by rail freight in carload lots only and by motor vehicle in truckload lots only.

(15)-(16) [Reserved]

(17) Specification MC 300, MC 301, MC 302, MC 303, MC 304, MC 305, MC 306, MC 307, MC 310, MC 311, MC 312, MC 330 or MC 331 (§§ 178.340, 178.341, 178.342, 178.343, 178.337 of this subchapter) cargo tanks, subject to the following conditions:

(i) Bottom outlets on Specification MC 304, MC 310, MC 311 or MC 312 cargo tanks must conform to § 178.342-5(a). Bottom outlets on Specification MC 330 cargo tanks must be equipped with valves conforming to § 178.337-11(c).

(ii) Specification MC 310, MC 311 or MC 312, cargo tanks must be equipped with pressure relief devices conforming to § 178.342-4. Safety relief devices on Specification MC 330 cargo tanks must conform with § 178.337-9.

(iii) Necessary interior cleaning of cargo tanks must be performed between changes in lading.

(18) [Reserved]

(19) Spec. 5L (§ 178.89 of this subchapter). Metal barrels or drums for gasoline shipments offered by or consigned to the Departments of the Army, Navy, and Air Force of the United States Government or Allies. Use of this container will be permitted because of the present emergency and until further order of the Department.

(20) Spec. 12D (§ 178.207 of this subchapter). Fiberboard boxes with inside containers which must be glass or earthenware not over one gallon each; authorized for not more than 75 pounds gross weight; not to contain more than 4 such inside containers if their capacity is greater than 5 pints each. Use of this container will be permitted because of the present emergency and until further order of the Department.

(21) Gasoline samples in boxes of metal not lighter than 20 gauge, United States standard, having hinged cover securely closed, and containing not more than 5 inside rectangular metal cans with screw cap closure, each having a capacity not to exceed ½ gallon, may be shipped when consigned to state laboratories for examination.

(22) Specification 17H or 37A (§§ 178.118 and 178.131 of this subchapter). Metal drums with inside glass packagings not over 9 pints capacity each. Inside containers may contain biological materials if these materials are not etiologic agents, except that etiologic agents exempt by § 173.386(d) are authorized.

(23) Specification 12A (§ 178.210 of this subchapter). Fiberboard box, with inside glass bottles or specification 2E (§ 178.24a of this subchapter) polyeth-

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[2] Use of existing tank cars authorized, but new construction not authorized.

ylene bottles, not over 1 gallon capacity each. Polyethylene bottles are authorized only for materials that will not react with, or cause decomposition of the plastic. Not more than four inside bottles exceeding 5 pints capacity each may be packed in a package. Shipper must have established that the completed package meets the test requirements prescribed by § 178.210-10 of this subchapter.

(24) Spec. 6D (§ 178.102 of this subchapter). Cylindrical steel overpack with inside spec. 2S (§ 178.35 of this subchapter) polyethylene container.

(25) Spec. 51 (§ 178.245 of this subchapter). Portable tanks.

(26) Specification 57 (§ 178.253 of this subchapter). Portable tanks. Not authorized for transportation by water.

(27) Specification 12P (§ 178.211 of this subchapter). Fiberboard box with one inside specification 2U (§ 178.24 of this subchapter) polyethylene container of not over 5-gallon capacity, or two inside specification 2U polyethylene containers of not over 2½ gallon capacity each. Authorized only for material which will not react with or cause decomposition of polyethylene. Not authorized for transportation by air.

(28) Specification 12A (§ 178.210 of this subchapter). Fiberboard boxes with inside metal containers not over 1-gallon capacity each. Not more than six metal containers shall be packed in a 275-pound test, double faced, corrugated fiberboard, specification 12A box and gross weight shall not exceed 45 pounds. The inner flap gaps of the box shall not exceed ⅝-inch and the box shall provide a tight fit so there is no movement of the cans within the box.

(29) Marine portable tanks meeting the requirements of 46 CFR Part 64 authorized for highway and cargo vessel only when shipped in support of off-shore oil well drilling activities. Tanks shall comply with mounting and tie-down requirements of § 178.245-4 of this subchapter when transported by highway.

(30) IM portable tanks, under conditions specified in the IM Tank Table.

(b) *Flammable liquids with flash points above 20° F. to 73° F.* Flammable liquids with flash points above 20° F. to 73° F. and having vapor pressure (Reid[1] test) not over 16 pounds per square inch, absolute, at 100° F. other than those for which special requirements are prescribed in this Part, must be packaged in packagings of a design and constructed of materials that will not react dangerously with or be decomposed by the chemical packed therein as follows (see paragraphs (c) through (i) of this section for high-pressure liquids and paragraph (m) of this section for flammable liquids which are also oxidizers, poison B liquids, organic peroxides or corrosive liquids):

(1) Containers as specified in paragraph (a) of this section, except that openings greater than 2.3 inches in diameter in barrels and drums are authorized when permitted by the specification.

(2) Spec. 17E or 17H (§ 178.116 or § 178.118 of this subchapter). Metal drums (single-trip).

(3) Specification 10B (§ 178.156 of this subchapter). Wooden barrels or kegs. Authorized only for alcohol and alcohol-water-mixtures.

NOTE 1: Until further order of the Department, wooden whiskey barrels, properly recoopered, which comply with all the provisions of spec. 10B (§ 178.156 of this subchapter), are also authorized. Marking is required on the head of each container, by the reconditioner, by hot branding or legible stenciling, as follows: DOT-10B.

Name or symbol (letters) of reconditioner; this must be registered with the Director, OHMT and located just above, below, or following the mark DOT-10B.

Size of marking (minimum) ¾ inch high.

(4) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes with inside containers which must be glass, earthenware, polyethylene (bags are not authorized), or metal, not over 1 gallon each. Packages containing inside glass or earthenware containers must not contain more than 4 such inside containers if their capacity is greater than 5 pints each. Polyethylene containers are authorized only for materials that will not react with or cause decomposition of the plastic.

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[1] ASTM Test D323.

NOTE 1: Until further order of the Department, fiberboard boxes, spec. 12B (§ 178.205-26(a) of this subchapter), with one inside rectangular metal can, spec. 2F (§ 178.25 of this subchapter), not to exceed 5 gallons capacity, are authorized. Gross weight of completed package not over 65 pounds.

(5) Spec. 12E (§ 178.208 of this subchapter). Fiberboard box with 1 or 2 rectangular metal inside containers of not over 5 gallons capacity each.

(6) Specification 57 (§ 178.253 of this subchapter). Steel portable tank. Authorized for transportation by water when having a minimum design pressure of 9 psig and equipped in accordance with § 178.253-4, except that frangible devices are not authorized. Also, for water transportation, no pressure relief device may open at less than 5 psig. Authorized for liquids with flash points above 20° F and a vapor pressure not over 16 psia at 100° F.

(7) Specification 37P (§ 178.133 of this subchapter). Steel drums with polyethylene liner (nonreusable container). Authorized only for materials that will not react with polyethylene and result in container failure. Not authorized for transportation by air.

(8) Specification 6D or 37M (nonreusable container) (§§ 178.102, 178.134 of this subchapter). Cylindrical steel overpack with an inside specification 2S or 2SL (§§ 178.35, 178.35a of this subchapter) polyethylene container. Authorized only for materials that will not react with polyethylene and result in container failure.

(9) Spec. 21P (§ 178.225 of this subchapter). Fiber drum overpack with inside Spec. 2S or 2SL (§ 178.35 or § 178.35a of this subchapter) polyethylene container. Authorized only for materials that will not react with polyethylene and result in container failure.

(10) Specification 37D (§ 178.137 of this subchapter). Nonreusable steel drum authorized only for a material not exceeding a weight of 10 pounds per gallon. For a material weighing more than 10 pounds per gallon but not exceeding a weight of 12 pounds per gallon, drum made of not less than 21-gage body and 20-gauge heads must be used.

(11) Specification 34 (§ 178.19 of this subchapter). Polyethylene drum. The shipper shall assure conformance with the requirements of § 173.24(d) of this part prior to first shipment.

(c) *Flammable liquids for which other special packing requirements are not prescribed.* Flammable liquids for which other special packing requirements are not prescribed in this part, must be shipped, depending upon their Reid[1] vapor pressures as prescribed in paragraphs (d) to (i) of this section.

(d) *When the vapor pressure does not exceed 16 pounds per square inch, absolute, at 100° F.* When the vapor pressure does not exceed 16 pounds per square inch, absolute, at 100° F., flammable liquids must be packed as prescribed in paragraphs (a) and (b) of this section.

(e) *When the vapor pressure exceeds 16 pounds per square inch, absolute, at 100° F.* When the vapor pressure exceeds 16 pounds per square inch, absolute, at 100° F., but does not exceed 27 pounds per square inch, absolute, at 100° F., flammable liquids must be packed in specification containers as follows:

(1) As prescribed in paragraphs (a)(1) to (11) of this section, except spec. 17E (§ 178.116 of this subchapter). Bung labels required, for metal barrels and drums, as prescribed in paragraph (i) of this section.

(2) Specification 103,[2] 103W, 103ALW, 103DW, 104,[2] 104W, 105A100,[2] 105A100ALW, 105A100W, 106A500X, 106A800XNC, 106A800NCI,[2] 109A100ALW, 109A300W, 110A500W, 111A60ALW1, 111A60F1, 111A60W1, 111A100W3, 111A100W4, 111A100W6, 112A200W, 112A400F, 114A340W, 115A60W1, 115A60W6, or 115A60ALW, (§§ 179.100, 179.101, 179.200, 179.201, 179.220, 179.221, 179.300, 179.301 of this subchapter) tank cars. Openings in tank heads to facilitate the application of linings are authorized on tank cars constructed before January 1, 1975. These openings must be closed in

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[1] ASTM Test D323.

[2] Use of existing tank cars authorized, but new construction not authorized.

an approved manner (§ 179.3 of this subchapter).

(3) Specification MC 304, MC 307, MC 310, MC 311, MC 312, MC 330, or MC 331 (§§ 178.340, 178.342, 178.343, 178.337 of this subchapter) cargo tanks, subject to the following conditions:

(i) Bottom outlets on Specification MC 304, MC 310, MC 311 cargo tanks must conform to § 178.342-5. Bottom outlets on Specification MC 330 cargo tanks must be equipped with valves conforming to § 178.337-11(c).

(ii) MC 310, MC 311 or MC 312 cargo tanks must have a design pressure of at least 25 psig. These cargo tanks must be equipped with pressure relief devices conforming to § 178.342-4.

(iii) MC 330 cargo tanks must be equipped with pressure relief devices conforming to § 178.337-9.

(iv) Each safety relief device must be set to discharge at no less than 25 psig.

(v) Necessary interior cleaning of cargo tanks must be performed between changes in lading.

(4) Spec. 51 (§ 178.245 of this subchapter). Portable tanks.

(5) IM portable tanks, under conditions specified in the IM Tank Table.

(f) *When the vapor pressure exceeds 27 pounds per square inch absolute at 100 °F.* When the vapor pressure exceeds 27 psia at 100 °F., but does not exceeds 40 psia (see note 1) at 100 °F., flammable liquids must be packed in specification containers as follows:

(1) Spec. 5, 5A, or 5P (§§ 178.80, 178.81, or 178.92 of this subchapter). Metal barrels or drums, with openings not exceeding 2.3 inches in diameter. Bung labels required as prescribed in paragraph (i) of this section.

(2) Cylinders as prescribed for any compressed gas except acetylene.

(3) Specification 105A100,[2] 105A100ALW, 105A100W, 106A500X, 106A800XNC, 106A800NCI,[2] 109A100ALW, 109A300W, 110A500W, 111A100W4, 112A200W, 112A400F, or 114A340W, §§ 179.100, 179.101, 179.200, 179.201, (179.300, 179.301 of this subchapter) tank cars. (See Note 1 of this paragraph.) Specification 104[2] 104W, and 111A100W3 (§§ 179.200, 179.201 of this subchapter), tank cars are authorized under conditions prescribed in paragraph (f)(4), of this section and Note 2 of this paragraph. Openings in tank heads to facilitate the application of linings are authorized on tank cars constructed before January 1, 1975. These openings must be closed in an approved manner (§ 179.3 of this subchapter).

(4) Specification 103[2], 103W, 103ALW, 104,[2], 104W, 111A60ALW1, 111A60F1, 111A60W1, 115A60W1, 115A60W6, or 115A60ALW (§§ 179.200, 179.201, 179.220, 179.221, of this subchapter) tank cars.

NOTE 1: Tanks built in compliance with American Railway Association specifications for class IV-A[2] tank cars authorized for use effective October 1, 1925, may be continued in service for the transportation of ethyl chloride and other liquids which do not have a vapor pressure exceeding 28 pounds per square inch, gauge pressure, at 100° F., provided there is stenciled on each side of the tank immediately below the valve protecting housing the words "Liquids having vapor pressure exceeding 28 pounds per square inch at 100° F. must not be loaded into this tank" in letters and figures at least 1 inch high. These tank cars must be retested as prescribed in current spec. 105A100W except that safety valves must open at pressure not exceeding 35 pounds, and be vapor tight at 28 pounds per square inch.

NOTE 2: When the vapor pressure exceeds 40 pounds per square inch, absolute, at 100° F., these flammable liquids are classed as flammable compressed gases and must be described, packed, and shipped as prescribed for such articles.

NOTE 3: Spec. 104[2] or 104-W tank cars are authorized provided they are equipped with approved fittings designed to provide for the loading, unloading, gauging, sampling, and taking temperature of the contents without removing the manway closure; that pressure relief valves are set to open at pressure of 35 pounds gauge (with a tolerance of plus or minus 3 pounds), and are vapor tight at 28 pounds per square inch gauge pressure; that bottom discharge outlets are of the same type as authorized for specification 104[2] or 104-W tank cars; and that there is stenciled on each side of the tank above the specification mark, in letters and figures at least 1 inch high. "For vapor pressures not exceeding 40 pounds per square inch, absolute, at 100 °F." Specification ICC-104[2] or 104-W tank cars, equipped with pressure relief valves set to open at pressure of 35 pounds gauge (with a tolerance of plus or minus 3 pounds) and which are vapor tight at 28 pounds per square inch gauge pressure are authorized provided that they are stenciled as required above.

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[2] Use of existing tank cars authorized, but new construction not authorized.

(5) Specification cargo tanks as prescribed in paragraph (e)(3) of this section.

(6) Spec. 51 (§ 178.245 of this subchapter). Portable tanks.

(7) IM portable tanks, under conditions specified in the IM Tank Table.

(g)-(h) [Reserved]

(i) *Bung label.* A flammable liquid as described in paragraph (e) or (f) of this section, shipped in a metal drum or barrel, in addition to the FLAMMABLE LIQUID label, must be labeled near the bung with a white rectangular label or tag measuring 5 by 3 inches, bearing the wording as displayed below:

BUNG LABEL

(Reduced Size)

(Black printing on white)

5 Inches

3 Inches

CAUTION Unscrew This Bung SLOWLY

Do not unscrew entirely until all interior pressure has escaped through the loosened threads.

REMOVE BUNG IN OPEN AIR. Keep all open flame lights and fires away. Inclosed Electric Lights are safe.

(j) *Viscous flammable liquids.* Flammable liquids which are viscous as defined in § 171.8 of this subchapter must be shipped in specification packagings as prescribed in paragraph (k) or (l) of this section.

(k) *Viscous flammable liquids having a vapor pressure which does not exceed 16 pounds per square inch, absolute, at 100° F.* (See paragraphs (c) to (i) of this section for higher pressure liquids) must be prepared for shipment in containers as follows:

(1) As prescribed in paragraphs (a) or (b) of this section, irrespective of flash point.

(2) Specification 6B, or 6C (§§ 178.98, 178.99 of this subchapter). Metal barrels or drums.

(3) Specification 37A or 37B (§§ 178.131, 178.132 of this subchapter). Metal drums (single-trip) not over 5 gallons with welded side seams. Not authorized for transportation by air.

(4) [Reserved]

(l) *Viscous flammable liquids with flash point above 20° F. to 73° F. and having a vapor pressure which does not exceed 18 pounds per square inch, absolute, at 100° F.* Viscous flammable liquids with flash point above 20° F. to 73° F. and having a vapor pressure which does not exceed 18 pounds per square inch, absolute, at 100° F. must be packaged as follows:

(1) As prescribed in paragraphs (e) to (i) of this section.

(2) Spec. 17E or 17H (§§ 178.116 or § 178.118 of this subchapter). Metal drums (single-trip).

(m) *Flammable liquids which are also organic peroxides, oxidizers, radioactive material, corrosive liquids or poison B liquids.* A flammable liquid which is also an organic peroxide, oxidizer, radioactive material, corrosive liquid, or poison B liquid must be packed as follows:

(1) Specification 1A, 1D, 1EX (single-trip) or 1M (§§ 178.1, 178.4, 178.6, 178.17 of this subchapter). Glass carboys in boxes, plywood drums, or expanded polystyrene packagings. Rated capacity may not exceed 5 gallons for Specification 1A. Not authorized for transportation by aircraft.

(2) Specification 15A, 15B, 15C, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside containers which must be glass, earthenware, or polyethylene not over 1 gallon capacity each. Inside containers must be cushioned with noncombustible packaging material in sufficient quantity to absorb the contents of the inner container.

(3) Specification 12B (§ 178.205 of this subchapter). Fiberboard box with inside metal cans, glass or earthenware containers not over 1-quart capacity each. Inside containers must be cushioned with incombustible packing material in sufficient quantity to absorb the contents of the inner container. Use of the inside metal can is authorized only for materials which will not react dangerously with the

metal can, or be decomposed by contact with it.

(4) Specification 5, 5A, 5B, 5C, 5P, 17C (single-trip), or 17E (single-trip) (§§ 178.80, 178.81, 178.82, 178.83, 178.92, 178.115, 178.116 of this subchapter). Metal barrels or drums. Removable head packagings over 16 gallons capacity are not authorized. Authorized only for materials which will not react dangerously with the drum metal, or be decomposed by contact with it.

(5) Specification 37P (§ 178.133 of this subchapter). Steel drums, not over 15 gallons capacity, with polyethylene liner (non-reusable container). Drums exceeding one gallon capacity must be constructed of at least 24-gauge metal. Authorized only for materials that will not react with polyethylene and result in container failure. Not authorized for transportation by air.

(6) Specification 12B (§ 178.205 of this subchapter). Fiberboard boxes with inside Specification 2E (§ 178.24a of this subchapter) polyethylene bottles not over 1-gallon capacity each. Not more than four 1-gallon polyethylene bottles shall be packed in one outside fiberboard box. Authorized only for material which will not react dangerously with or be decomposed by contact with polyethylene.

(7) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes with one inside polyethylene bottle not over 5-gallons capacity, as specified by § 178.205-34 of this subchapter. Authorized only for material which will not react dangerously with or cause decomposition of polyethylene.

(8) Specification 12P (§ 178.211 of this subchapter). Fiberboard box with one inside specification 2U (§ 178.24 of this subchapter) polyethylene container of not over 6-gallon capacity, or two inside specification 2U polyethylene containers of not over 2½ gallon capacity each. Authorized only for material which will not react with or cause decomposition of polyethylene. Not authorized for transportation by air.

(9) Specification steel or nickel cylinders as prescribed for any compressed gas except acetylene. All cylinder valves must be protected by one of the methods described in § 173.301(g) (1), (2), or (3) of this part. See § 173.34(e)(16).

(10) Specification MC 303 or MC 304: Tank motor vehicle meeting § 178.343-2(c) of this subchapter. If the cargo tank is constructed with bottom outlets, they must meet § 178.342-5(a) of this subchapter. Not authorized for flammable liquids which are also organic peroxides. MC 303 not authorized for transportation by water.

(11) Specification MC 305, MC 306, or MC 307 (§§ 178.340, 178.341, 178.342 of this subchapter). Tank motor vehicles meeting § 178.343-2(c) of this subchapter. Not authorized for flammable liquids which are also organic peroxides. MC 305 and MC 306 not authorized for transportation by water.

(12) Specification MC 310, MC 311, or MC 312 (§§ 178.340, 178.343 of this subchapter). Tank motor vehicles. If the cargo tank is constructed with bottom outlets, they must meet §§ 178.342-5(a) and 178.343-5 of this subchapter. Not authorized for flammable liquids which are also organic peroxides.

(13) Specification 103AW, 103ALW, 103A-ALW, 103ANW, 103BW, 103CW, 103DW, 103EW, 103W, 104W, 105A100W, 111A60ALW1, 111A60ALW2, 111A60W1, 111A60W2, 111A60W5, 111A100F2, 111A100W3, 111A100W6, 115A60W6, or AAR206W (§§ 179.200, 179.201, 179.220 of this subchapter). Tank cars. All special requirements for tank cars according to flash point, vapor pressure, and viscosity, in paragraphs (a) through (l) of this section apply. Not authorized for flammable liquids which are also organic peroxides.

(14) Specification 112A200W or 114A340W (§§ 179.100, 179.101 of this subchapter). Tank cars. Authorized only for propylene oxide except 112A200W also authorized for acrylonitrile and dichlorobutene.

(15) Specification 51 (§ 178.245 of this subchapter). Portable tank. Authorized only for a flammable liquid which is also a Poison B liquid. Bottom outlets are not authorized.

(16) Specification 6D or 37M (non-reusable container) (§§ 178.102, 178.134 of this subchapter). Cylindrical steel overpacks with an inside specification 2S or 2SL (§§ 178.35, 178.35a

of this subchapter) polyethylene container. Authorized only for materials that will not react with polyethylene and result in container failure.

(17) Specification 6D or 37M (nonreusable container) (§§ 178.102, 178.134 of this subchapter). Cylindrical steel overpacks with an inside specification 2U (§ 178.24 of this subchapter) polyethylene container, not over 5 gallons capacity. Authorized only for materials that will not react with polyethylene and result in container failure.

(18) IM portable tanks, under the conditions specified in the IM Tank Table. Not authorized for flammable liquids which are also organic peroxides or oxidizers.

(19) Specification 34 (§ 178.19 of this subchapter). Polyethylene drum. Authorized only for flammable liquids which are also organic peroxides or corrosive liquids. The shipper shall assure conformance with the requirements of § 173.24(d) of this part prior to first shipment.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[29 FR 18700, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.119, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.120 Automobiles, motorcycles, tractors, or other self-propelled vehicles.

(a) Automobiles, motorcycles, tractors, or other self-propelled vehicles, equipped with flammable liquid fuel tanks, provided these tanks are securely closed, are not subject to any other requirements for transportation by rail or highway. For transportation by air see paragraph (d) of this section.

(b) *Engines or motors (internal combustion).* Engines or motors (internal combustion) employing liquid fuel classed as flammable liquid in this chapter, whether shipped separately or as a part of other apparatus, unless specifically exempt in paragraph (a) of this section, must have their fuel tanks completely drained. Fuel may be left in the carburetor, fuel pump, and fuel lines provided the total flammable fuel content does not exceed 16 ounces and provided the lines are tightly closed to prevent leakage of the fuel.

(c) *Truck bodies or trailers on flat cars.* Truck bodies or trailers with automatic heating or refrigerating equipment of the flammable liquid type may be shipped with fuel tanks filled and equipment operating or inoperative, when used for the transportation of other freight and loaded on flat cars as part of a joint rail highway movement, provided the equipment and fuel supply are of a type examined by the Bureau of Explosives and approved by the Director, OHMT. The heating or refrigerating equipment is considered as carriers' equipment and is not subject to any other requirements of this subchapter.

(d) Except as provided in § 175.305 of this subchapter, each automobile, motorcycle, tractor, or other self-propelled vehicle, powered by an internal combustion engine fueled by a flammable or combustible liquid, when offered for transportation by air, must have the fuel tank drained of all fuel and have the tank opening tightly closed.

[29 FR 18700, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16067, Apr. 15, 1976; Amdt. 173-138, 45 FR 32695, May 19, 1980]

§ 173.121 Carbon bisulfide (disulfide).

(a) Carbon bisulfide must be packed in specification containers as follows:

(1) [Reserved]

(2) Spec. 12A or 12B (§ 178.210 or § 178.205 of this subchapter). Fiberboard boxes with inside containers which must be glass or earthenware, not over 1 pint each, or metal cans, not over 1 quart each. Outside containers not to exceed 65 pounds gross weight.

(3) Specification 15A, 15B, 15C, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, or § 178.191 of this subchapter). Wooden boxes with strong inside metal containers or with inside glass or earthenware container not over 5 pints capacity each.

(4) Spec. 17E (§ 178.116 of this subchapter). Metal drums (single-trip) not over 5 gallons capacity each, with openings not exceeding 2.3 inches in diameter.

(5) Spec. 5, 5A, or 17C (single-trip) (§ 178.80, § 178.81, or § 178.115 of this subchapter). Metal barrels or drums not over 55 gallons capacity each, with openings not exceeding 2.3 inches in diameter.

(6) Tank cars as prescribed in § 173.119(a)(12). (See § 173.10 for shipping instructions.)

(7) Specification cylinders as prescribed for any compressed gas except acetylene.

[29 FR 18700, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-81, 39 FR 17317, May 15, 1974; Amdt. 173-94, 41 FR 16067, Apr. 15, 1976; Amdt. 173-14, 45 FR 59888, Sept. 11, 1980; Amdt. 173-149, 46 FR 49894, Oct. 8, 1981; Amdt. 173-52, 46 FR 62455, Dec. 24, 1981; Amdt. 173-162, 48 FR 10226, Mar. 10, 1983]

§ 173.122 Acrolein, inhibited.

(a) Acrolein must be inhibited when shipped, and when offered for transportation must be packaged as follows:

(1) Spec. 5, 5A, or 5B (§§ 178.80, 178.81, or § 178.82 of this subchapter). Metal drums not over 55 gallons capacity each. Spec. 5 or 5B drums must have no opening exceeding 2.3 inches in diameter.

(2) Specification 15A, 15B, 15C, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with strong inside tight metal containers not over 5 gallons capacity each.

(3) Specification 105A300W (§§ 179.100, 179.101, of this subchapter) tank car.

(i) Each tank car must be stenciled DOT-105A200W, and must be equipped with the 150 psig safety relief valve required by that specification.

(ii) Each tank car must be marked "ACROLEIN" in accordance with the requirements of § 172.330 of this subchapter.

(4) Spec. 17C (§ 178.115 of this subchapter). Metal drums (single-trip) with chime reinforcement for bottom head chime seam and having fixed heads, not over 55 gallons capacity. The openings shall be located in one head and shall not exceed 2.3" in diameter.

(5) Specification 4B240, 4BA240, or 4BW240 (§§ 178.50, 178.51, 178.61 of this subchapter) welded cylinders each having a water capacity not exceeding 500 pounds.

(6) Specification 51 (§ 178.245 of this subchapter) portable tanks each having a water capacity not exceeding 425 gallons.

(b) Acrolein must be inhibited and when offered for transportation by cargo-only aircraft must be packed in specification containers as follows:

(1) Specification 15A, 15B, 15C, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, or § 178.191 of this subchapter). Wooden boxes, or Spec. 12B (§ 178.205 of this subchapter) fiberboard boxes having not more than one inside glass container of not over 1-quart capacity, securely cushioned within a metal container.

[29 FR 18700, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.122, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.123 Ethyl chloride.

(a) Ethyl chloride must be packed in specification containers as follows:

(1) Specification 15A, 15B, 15C, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, or § 178.191 of this subchapter). Wooden boxes with glass, earthenware, or metal inside containers not over 1-pound capacity each.

(2) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes with glass, earthenware, or metal inside containers not over 1 pound capacity each. Outside containers not to exceed 65 pounds gross weight.

(3) Spec. 5A (§ 178.81 of this subchapter). Metal barrels or drums not over 33 gallons capacity each.

(4) Cylinders as prescribed for any compressed gas, except acetylene.

(5) Specification 105A100,[1] 105A100W, 111A100W4, 112A200W, 112A400F, or 114A340W (§§ 179.100, 179.101, 179.200, 179.201 of this subchapter) tank cars. Specification 114A340W tank cars must not be equipped with any bottom outlet. Bottom washout permitted. (See Note

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[1] The use of existing tank cars authorized but new construction not authorized.

1 following § 173.119(f)(3).) (See § 173.10 for shipping instructions.)

(6) Specification MC 330 or MC 331 (§ 178.337 of this subchapter). Tank motor vehicles. Tank bottom outlets must be equipped with valves conforming with § 178.337-11(c) of this subchapter.

(7) Specification 51 (§ 178.245 of this subchapter) portable tanks.

(b) Outage for all containers except tank cars must be 7.5 percent or more at 70° F. Outage for tank cars must be 4.2 percent or more at 70° F.

(c) Maximum quantity in one package for cargo aircraft only is limited to 300 pounds in cylinders and 15 pounds in other packagings.

[29 FR 18700 Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.123. see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.124 Ethylene oxide.

(a) Ethylene oxide must be packed in specification containers as follows and copper or copper bearing alloys shall not be used in any part of a container, container valve or other container appurtenance if that part is normally in contact with ethylene oxide liquid or vapor.

(1) Specification 15A, 15B, 15C, 16A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.191 of this subchapter) wooden boxes and Spec. 12B (§ 178.205 of this subchapter) fiberboard boxes, with inside metal packaging not over 12-ounce capacity each. Each inside packaging must have a minimum bursting strength of 180 psig as prepared for shipment and be provided with a safety vent having a minimum diameter of 0.1023 inch and closed with fusible metal having a yield temperature of 157° to 170 °F. The safety vent opening must be hot tinned before filling with fusible metal. Filling must be such that the container will not be liquid full below 185 °F. Each inside packaging must be completely insulated except for top closure. Not more than 12 inside packages nor more than one layer of packagings may be packed in one outside box.

(2) Cylinders as prescribed for any compressed gas, except acetylene, not exceeding 30 gallons nominal water capacity, which meet the following requirements: All cylinders must be seamless or steel welded. Cylinders must be equipped with safety devices of the fusible plug type with threaded straight bore orifice, with yield temperature of 157° to 170 °F., having a minimum vent area of 0.0055 square inch per pound of water capacity for packagings not over 1-gallon capacity and 0.0012 square inch per pound of water capacity for all packagings over 1-gallon capacity. Each cylinder must be tested for leakage at a pressure of at least 15 psig with an inert gas before each refilling. Fillings must be such that the packaging will not be liquid full at 185 °F. Pressurizing valves must be provided for all packaging over 1-gallon capacity. Eductor tubes must be provided for all packagings over 5-gallon capacity. Cylinders having a water capacity in excess of 1-gallon must be insulated.

(3) In addition to specification packagings prescribed in this section, ethylene oxide may be shipped when packed in strong noncombustible outside packagings, with inside containers which must be securely sealed glass ampules or vials, contents not over 100 grams each, or inside aluminum cartridges, contents not over 138 grams each, cushioned in vermiculite or equally efficient noncombustible cushioning material. Not more than 100 grams of ethylene oxide shall be packed in any outside packaging except a maximum of 12 aluminum cartridges may be packed in a DOT Specification 12B (§ 178.205 of this subchapter) fiberboard box having top and bottom pads and an inside perimeter liner. A maximum of 10 such boxes may be overpacked in a master carton under the provisions of § 173.25(a).

(4) Spec. 5P (§ 178.92 of this subchapter) Lagged steel drums not over 61 gallons capacity each. Drums must be equipped with safety devices of the fusible plug type with threaded straight bore orifice, with yield temperature of 157 to 170° F. having a minimum vent area of 0.0055 square inch per pound of water capacity of the container for containers not over 1

gallon capacity and 0.0012 square inch per pound of water capacity of the container for all containers over one gallon capacity. Each drum must be tested for leakage at a pressure of at least 15 p.s.i. gauge with an inert gas before each refilling; top head of each drum must be plainly marked with paint "Keep This End Up." Filling shall be such that the container will not be liquid full below 185° F. and the maximum filling for 61 gallon drums must not exceed 55 gallons of ethylene oxide at 60° F.

(5) Specification 105A100W or 111A-100W4 (§§ 179.100, 179.101, 179.200, 179.201 of this subchapter) tank car. Each 105A* * * W series tank car must be equipped with a 75 p.s.i.g. safety valve and must be stenciled 105A100W. Outage of each tank must be sufficient to prevent the tank from becoming liquid full at 105° F. Each tank, loaded or empty, must be padded with dry nitrogen or other suitable dry inert gas in sufficient quantity to render the vapor phase in the tank nonflammable at a temperature up to 105° F. Consideration must be given to the lading temperature and the solubility of the gas in ethylene oxide as well as the partial pressure required of the padding gas used to provide this protection. The gas must be free of impurities which may cause the ethylene oxide to rearrange chemically or to polymerize, decompose, or undergo other violent chemical reaction. See §§ 179.102-12 and 179.202-18 of this subchapter for special requirements for tank cars authorized for ethylene oxide. Openings in tank heads to facilitate application of nickel lining are authorized on tank cars constructed before January 1, 1975. These openings must be closed in an approved (§ 179.3 of this subchapter) manner (See Note 1 of § 173.119(f)(3)).

(i) Each tank car must be marked "ETHYLENE OXIDE" in accordance with the requirements of § 172.330 of this subchapter.

(ii) Each Specification 105 tank car built after August 31, 1981, and before March 1, 1984, used for the transportation of ethylene oxide, must conform to DOT Specification 105J, except for the safety relief valve requirements of § 179.106-2(c)(4). Each Specification 105 tank car built after February 29, 1984, used for the transportation of ethylene oxide, must conform to DOT Specification 105J.

(iii) After December 31, 1986, each Specification 105 tank car built before September 1, 1981, having a water capacity (shell full volume, including manways) exceeding 18,500 U.S. gallons and used for the transportation of ethylene oxide shall conform to Specification 105J.

(iv) After December 31, 1986, each Specification 111 tank car with a water capacity (shell full volume, including manways) exceeding 18,500 U.S. gallons, used for the transportation of ethylene oxide, shall conform to DOT Specification 111J.

(v) Specification 111 tank cars built after March 1, 1984, are not permitted for the transportation of ethylene oxide

(6) Specification 51 (§ 178.245 of this subchapter) portable tank. Each tank, loaded or empty, must be padded with dry nitrogen or other suitable dry inert gas in sufficient quantity to render the vapor phase in the tank nonflammable at a temperature up to 105° F. Consideration must be given to the lading temperature and the solubility of the gas in ethylene oxide as well as the partial pressure required of the padding gas used to provide this protection. The gas must be free of impurities which may cause the ethylene oxide to rearrange chemically or to polymerize, decompose, or undergo other violent chemical reaction. Each tank must be constructed to be in compliance with the following requirements:

(i) The tank must be insulated with mineral wool or glass fiber of sufficient thickness so that the thermal conductance at 60° F. is not more than 0.075 B.t.u. per hour, per square foot, per degree Fahrenheit temperature differential. When a tank is equipped with fusible plugs instead of a safety relief valve or frangible disc, insulation must meet the requirements of paragraph (a)(6)(iii) of this section.

(ii) The insulating material of the tank must be protected by a steel jacket having a minimum thickness of 12 gauge. This jacket must be applied to prevent moisture from coming in contact with the insulation.

(iii) Each tank must be equipped with a safety relief valve or frangible disc, meeting the requirements of § 173.315, set to relieve at 75 p.s.i.g. Instead of a safety relief valve or frangible disc, a tank may be equipped with safety devices of the fusible plug type with threaded straight base oriface, with yield temperature of 157° to 170° F., having a minimum vent area of 0.0012 square inch per pound of water capacity of the container. When a fusible plug is used instead of a safety relief valve or frangible disc, the tank must be insulated with mineral wool or glass fiber of such insulating properties and required additional thickness that the tank filled as for shipment will not rupture in a fire.

(iv) Filling must be such that the tank will not be liquid full below 185° F.

(v) Copper, silver, mercury, magnesium, or their alloys may not be used in any part of the tank or appurtenances if that part or appurtenance is normally in contact with ethylene oxide liquid or vapor.

(vi) Neoprene, natural rubber, and asbestos gaskets are prohibited. All packings and gaskets must be constructed of materials which do not react spontaneously with or lower the autoignition temperature of ethylene oxide.

(vii) The capacity of the tank may not exceed 300 gallons.

(b) The maximum quantity in one package for cargo aircraft only is limited to 300 pounds in cylinders and 15 pounds in other packagings.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[29 FR 18700, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.124, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.125 Alcohol, n.o.s. (flammable liquid).

(a) Except as otherwise provided in this Part, alcohol, n.o.s., which is classed as a flammable liquid must be packaged as follows:

(1) In containers as prescribed in § 173.119 (a) and (b).

(2) Securely closed metal tanks of not exceeding 16 gallons capacity, made of metal not lighter than 20 gauge, United States standard, packed in strong outside wooden boxes, may be used for the transportation of natural history or laboratory specimens preserved in alcohol, when shipped by or for the United States Government.

(3)-(5) [Reserved]

(6) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes with inside polyethylene bottles, not over 1-gallon capacity each, suitably cushioned to prevent movement within the box.

(7) Specification 34 (§ 178.19 of this subchapter). Polyethylene drum.

[29 FR 18700, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.125, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.126 Nickel carbonyl.

Nickel carbonyl must be packed in specification steel or nickel cylinders as prescribed for any compressed gas except acetylene. A cylinder used exclusively for nickel carbonyl may be given a complete external visual inspection in lieu of the interior hydrostatic pressure test required by § 173.34(e) of this part. Visual inspection must be in accordance with CGA Pamphlet C-6. All cylinder valves must be protected by one of the methods described in § 173.301(g) (1), (2) or (3) of this part.

[Amdt. 173-52, 46 FR 62455, Dec. 24, 1981]

§ 173.127 Nitrocellulose or collodion cotton, fibrous or nitrostarch, wet; nitrocellulose flakes; colloided nitrocellulose, granular, flake, or block, and lacquer base or lacquer chips, wet.

(a) Nitrocellulose, fibrous, wet with alcohol or solvent, must contain at least 25 percent by weight of alcohol or a solvent with flash point not lower than 25° F.; collodion cotton, fibrous and nitrostarch, wet with alcohol or a solvent, must contain at least 30 percent by weight of alcohol or a solvent with flash point not lower than 25° F.; nitrocellulose flakes; colloided nitrocellulose, granular or flake; lacquer base or lacquer chips, wet with alcohol or a solvent, must contain at least 20 percent by weight of alcohol or a solvent with flash point not lower than 25° F., and nitrocellulose blocks wet with alcohol must contain at least 25 percent by weight of alcohol and must be packed in specification containers as follows:

(1) Containers, except cargo tanks or tank cars, as prescribed in § 173.119.

(2) Specification 6B, 6C, or 6J (§§ 178.98, 178.99, 178.100 of this subchapter). Metal barrels or drums not over 55 gallons capacity. Specification 6J (§ 178.100 of this subchapter) drums must have removable heads of 14 gauge metal or 16 gauge metal with one or more corrugations near the periphery and heads must have a minimum convexity of ⅜ inch; each drum must have three rolled or swedged-in hoops, one of which shall be in the body near the curl.

(3) [Reserved]

(4) Spec. 37A or 37B (§ 178.131 or § 178.132 of this subchapter). Metal barrels or drums.

(5) Spec. 6J (§ 178.100 of this subchapter). Metal drums. Authorized only for nitrocellulose in solid block forms and wet with alcohol to not less than 25 percent by weight. Authorized only for carload or truckload shipments.

(b) Except for Spec. 37A which is limited to 480 pounds, gross weight of any container must not exceed 490 pounds.

[29 FR 18700, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16068, Apr. 15, 1976; Amdt. 173-14, 45 FR 59886, Sept. 11, 1980; Amdt. 173-187, 50 FR 11703, Mar. 25, 1985]

§ 173.128 Paint and paint related material (flammable liquids).

(a) Except as otherwise provided in this part, the description "Paint" is the proper shipping name for paint, lacquer, enamel, stain, shellac, varnish, liquid aluminum, liquid bronze, liquid gold, liquid wood filler, and liquid lacquer base. The description "Paint related material" is the proper shipping name for a paint thinning, reducing or removing compound. However, if a more specific description is listed in § 172.101, that description must be used. Paint and paint related material must be packaged as follows:

(1) As prescribed in § 173.119, according to flash point, pressure, or viscosity.

(2) Specification 37A or 37B (§§ 178.131, 178.132 of this subchapter). Metal drums (single-trip) not over 5 gallons capacity, with welded side seams for drums over 2 gallons capacity, irrespective of flash point or viscosity. Specification 37A metal drums constructed with 26-gauge body sheets, 24-gauge removable heads, and 26-gauge bottom heads are authorized for not over 80 pounds gross weight. Not authorized for transportation by air.

(3) Specification 52[1] or 57 (§§ 178.251, 178.253 of this subchapter). Metal portable tank. Not authorized for transportation by water except as prescribed in § 173.119(b)(6) of this subchapter.

(4) Specification 37C (§ 178.135 of this subchapter). Metal drums (non-reusable containers) not over 5 gallons capacity each. Authorized only for materials having flash point above 20° F. Not authorized for transportation by air.

(5) Specification 34 (§ 178.19 of this subchapter). Polyethylene drum. The shipper shall assure conformance with the requirements of § 173.24(d) of this part prior to first shipment.

(b) The flammable liquids identified in paragraph (a) of this section, in glass packagings of not over 1 quart capacity each, or in metal packagings of not over 5 gallons capacity each, further overpacked in a strong outside packaging are excepted from the specification packaging requirements of this part.

(c) Special exceptions for shipment of paint and paint related material in the ORM-D class are provided in Subpart N of this part.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[29 FR 18700, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.128, see the List of CFR

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[1] Use of existing tanks authorized. Construction not authorized after May 31, 1972.

Sections Affected appearing in the Finding Aids section of this volume.

§ 173.130 Refrigerating machines.

Refrigerating machines assembled for shipment and containing limited quantities of 15 pounds or less of a flammable liquid for their operation are excepted from labeling and the specification packaging requirements of this subchapter (except when offered for transportation by air). In addition, shipments are not subject to Subpart F of Part 172 of this subchapter, to Part 174 of this subchapter except § 174.24 and to Part 177 of this subchapter except § 177.817.

[Amdt. 173-94, 41 FR 16068, Apr. 15, 1976, as amended by Amdt. 173-94A, 41 FR 40681, Sept. 20, 1976]

§ 173.131 Road asphalt, or tar, liquid.

(a) Road asphalt, or tar, liquid, must be packed in specification containers as follows:

(1) As prescribed in § 173.119, according to flash point, pressure, or viscosity.

(2) In cargo tanks that are at least equivalent in design and construction to Specification MC-306 (§§ 178.340, 178.341 of this subchapter) except for the requirements of §§ 178.340-10, 178.341-3, 178.341-4, and 178.341-5.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[29 FR 17800, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.131, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.132 Adhesive; cement; container cement; linoleum cement; pyroxylin cement; rubber cement; tile cement; wallboard cement, and coating solution.

(a) Except as otherwise provided in this part, a flammable liquid which is an adhesive; cement; container cement; linoleum cement; pyroxylin cement; rubber cement; tile cement; wallboard cement, or coating solution must be packaged as follows:

(1) As prescribed in § 173.119, irrespective of flash point or viscosity.

(2) Specification 52[1] or 57 (§§ 178.251, 178.253 of this subchapter). Metal portable tank. Not authorized for transportation by water except as prescribed in § 172.119(b)(6) of this subchapter.

(3) Specification 37C (§ 178.135 of this subchapter). Metal drums (non-reusable container) not over 5 gallons capacity each. Authorized only for materials having flash point above 20° F. Not authorized for transportation by air.

(b) The adhesive and cements identified in paragraph (a) of this section, except any adhesive or cement containing carbon bisulfide (carbon disulfide), in glass or leakproof packagings consisting of a fiberboard body and metal tops and bottoms of not over 1-quart capacity each, or metal packagings of not over 5 gallons capacity each, further overpacked in a strong outside packaging are excepted from the specification packaging requirements of this part.

[29 FR 18700, Dec. 29, 1964, as amended by Order 66, 30 FR 5744, Apr. 23, 1965. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.132, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.133 Spirits of nitroglycerin.

(a) Spirits of nitroglycerin means nitroglycerin in ethyl alcohol or in propylene glycol. Solutions of nitroglycerin means nitroglycerin in acetone. These mixtures and solutions may not contain more than 10 percent by weight of nitroglycerin. They must be packed in specification packings as follows:

(1) Specifications 15A, 15B, 15C, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes lined with paraffined paper, Spec. 2L (§ 178.30 of this subchapter), and with inside packagings securely closed with rubber stoppers tied in place. The inside packagings must be entirely surrounded by at least 2 inches of dry, fine sawdust or kieselguhr. Not more

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[1] Use of existing tanks authorized. Construction not authorized after May 31, 1972.

than 6 quarts of the spirits or solutions may be packed in any outside wooden box. Inside packagings made of metal are not authorized.

(2) Specification 12A or 12B (§§ 178.210 or 178.205 of this subchapter). Fiberboard boxes or Spec. 21C (§ 178.224 of this subchapter) fiber drums laminated with a 0.004 inch polyethylene lining. Inside packagings must be Spec. 2E polyethylene bottles or Spec. 2U polyethylene containers not exceeding 5 gallons capacity each, overpacked in a strong polyethylene bag. The inside packagings must be entirely surrounded by at least 2 inches of dry, fine sawdust or kieselguhr. Not more than 6 quarts of the nitroglycerin mixture may be packed in one outside packaging, except that a maximum of 5 gallons of a nitroglycerin-propylene glycol mixture may be packaged in one Spec. 2U and overpacked in the fiber drum.

(b) Spirits of nitroglycerin consisting of not over 1 percent by weight of nitroglycerin in ethyl alcohol or propylene glycol, in addition to containers specified in paragraphs (a)(1) and (a)(2) of this section, may be packed in specification packagings as follows:

(1) Specification 15A, 15B, 15C, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside glass containers not over 1-quart capacity each, cushioned by at least 2 inches of dry, fine sawdust or kieselguhr.

[29 FR 18700, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-149, 46 FR 49894, Oct. 8, 1981; Amdt. 173-187, 50 FR 11703, Mar. 25, 1985]

§ 173.134 Pyroforic liquids, n.o.s.

(a) Pyroforic liquids, n.o.s., must be packed in specification packagings as follows:

(1) Specification steel or nickel cylinders prescribed for any compressed gas except acetylene having a minimum design pressure of 175 pounds per square inch are authorized. Cylinders with valves must be:

(i) Equipped with steel valve protection caps or collars, when shipped loose,

(ii) Overpacked in a strong wooden box; or

(iii) Overpacked in a Specification 12A or 12B (§§ 178.210, 178.205 of this subchapter) fiberboard box or Specification 33A (§ 178.150 of this subchapter) polystyrene case. When overpacked, cylinders must be secured to protect all valves. Unless packed in a box or case, any safety relief device must be in the vapor space of any loaded cylinder. (See §§ 174.300(d) and 177.837(d) of this subchapter.)

(2) Specification 15A, 15B, 15C, or 19B (§§ 178.168, 178.169, 178.170, 178.191 of this subchapter). Wooden boxes or Spec. 12B (§178.205 of this subchapter) fiberboard boxes enclosing not more than four strong tight metal cans with inside containers of glass or metal, not over 1-quart capacity each, having positive screwcap closures adequately gasketed ahead of the threads. Inside containers must be cushioned on all sides with dry, absorbent, incombustible material in a quantity sufficient to absorb the entire contents. The strong tight metal cans must be closed by positive means, not by friction.

(3) Spec. 17C or 37A (§ 178.115 or 178.131 of this subchapter). Metal drums (single-trip) with inside metal cans not over 1 gallon capacity each, constructed of not less than 28 gauge electro-coated tin plate closed by positive means, not friction. Inside containers shall have no opening exceeding 1 inch diameter and must be surrounded on all sides with incombustible cushioning material. Spec. 17C, 30-gallon capacity drums, shall contain not more than 20 gallons of pyroforic liquids, n.o.s. per drum and 55-gallon capacity drums shall contain not more than 35 gallons of pyroforic liquids, n.o.s. per drum; each layer of inside containers must be separated by a tin plate separator in addition to cushioning material. Spec. 37A drums shall not exceed 5 gallons capacity each.

(4) Spec. 105A300-W (§§ 179.100 and 179.101 of this subchapter) tank cars.

(5) Spec. 51 (§ 178.245 of this subchapter). Portable tanks having a minimum design pressure of 175 pounds per square inch. Safety relief devices must communicate with the vapor space when tanks are fully loaded.

(6) Specification MC 330 or MC 331 (§ 178.337 of this subchapter). Tank

motor vehicles having a minimum design pressure of 175 p.s.i. Safety relief devices must communicate with the vapor space when tanks are fully loaded. Tank bottom outlets must be equipped with valves conforming with § 178.337-11(c) of this subchapter.

[Order 66, 30 FR 5744, Apr. 23, 1965. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.134, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.135 Diethyl dichlorosilane, dimethyl dichlorosilane, ethyl dichlorosilane, ethyl trichlorosilane, methyl trichlorosilane, trimethyl chlorosilane, and vinyl trichlorosilane.

(a) Diethyl dichlorosilane, dimethyl dichlorosilane, ethyl dichlorosilane, ethyl trichlorosilane, methyl trichlorosilane, trimethyl chlorosilane, and vinyl trichlorosilane must be packaged as follows:

(1) Specification 15A, 16B, or 19B (§§ 178.168, 178.186, 178.191 of this subchapter). Wooden boxes with inside glass containers not over 1-gallon capacity each, securely closed and cushioned with incombustible absorbent material.

(2) Spec. 17H or 37A (§ 178.118 or § 178.131 of this subchapter). Metal drums (single-trip) with glass inside containers not over 1 gallon capacity each securely closed and cushioned with incombustible absorbent material.

(3) Spec. 5A (§ 178.81 of this subchapter). Metal drums not over 55 gallons capacity.

(4) [Reserved]

(5) Specifications 5, 5B, 5C, and 17E (single-trip) (§§ 178.80, 178.82, 178.83, 178.116 of this subchapter). Metal drums. Not authorized for shipment by air.

(6) Specification steel or nickel cylinders as prescribed for any compressed gas except acetylene.

(7) Spec. 103,[1] 103-W, 111A60-F-1, or 111A60-W-1 (§§ 179.200, 179.201 of this subchapter). Tank cars, without bottom discharge outlet.

(8) Spec. 105A100,[1] 105A100-W, or 111A100-W-4 (§§ 179.100, 179.101, 179.200, 179.201 of this subchapter). Tank cars.

(9) Specification MC 300, MC 303, MC 304, MC 306, MC 307, MC 330 or MC 331 (§§ 178.340, 178.341, 178.342, 178.337 of this subchapter). Tank motor vehicles having cargo tanks of steel or stainless steel construction. Bottom outlets, if any, must be equipped with valves conforming with § 178.342-5(a) of this subchapter.

(10) Specification 51 (§ 178.245 of this subchapter). Portable tanks.

(11) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter) are authorized under conditions specified in the IM Tank Table.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[29 FR 18700, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.135, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.136 Methyl dichlorosilane and trichlorosilane.

(a) Methyl dichlorosilane and trichlorosilane must be packed in specification containers as follows:

(1) Specification 15A, 15B, or 19B (§§ 178.168, 178.169, 178.191 of this subchapter). Wooden boxes with inside glass containers not over 1-quart capacity each, securely closed and cushioned with incombustible absorbent material.

(2) Spec. 17H or 37A (§ 178.118 or § 178.131 of this subchapter). Metal drums (single-trip) with glass inside containers not over 1 quart capacity each securely closed and cushioned with incombustible absorbent material.

(3) Specification 5A, 5B, or 5C (§§ 178.81, 178.82, 178.83 of this subchapter). Metal drums not over 55 gallons capacity each. Specification 5B drums must have no opening exceeding 2.3 inches in diameter. Not authorized for shipment by air.

(4) [Reserved]

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[1] Use of existing tanks authorized. Construction not authorized after May 31, 1972.

(5) Specification steel or nickel cylinders as prescribed for any compressed gas except acetylene.

(6) Spec. 103,[1] 103-W, 111A60-F-1, or 111A60-W-1 (§§ 179.200, 179.201 of this subchapter). Tank cars, without bottom discharge outlet.

(7) Spec. 105A100,[1] 105A100-W, or 111A100-W-4 (§§ 179.100, 179.101, 179.200, 179.201 of this subchapter). Tank cars.

(8) Specification MC 330 or MC 331 (§ 178.337 of this subchapter). Tank motor vehicles. Tank bottom outlets must be equipped with valves conforming with § 178.337-11(c) of this subchapter.

(9) Spec. 51 (§ 178.245 of this subchapter). Portable tanks.

(10) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter) are authorized under conditions specified in the IM Tank Table.

[29 FR 18700, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.136, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.137 Lithium aluminum hydride, ethereal.

(a) Lithium aluminum hydride, ethereal, must be packed in specification containers as follows:

(1) Specification 15A, or 19B (§§ 178.168, 178.191 of this subchapter). Wooden boxes with inside glass or earthenware containers not over 1-quart capacity each, enclosed in airtight metal cans and cushioned with sufficient incombustible cushioning material to completely absorb the contents in event of leakage.

(2) Specification 6B, 6C, or 17H (single-trip) (§§ 178.98, 178.99, 178.118 of this subchapter). Metal barrels or drums with not more than one inside glass container not exceeding 2 gallons capacity. The inside container must be completely cushioned in sufficient incombustible cushioning material to completely absorb the contents in event of breakage.

(3) Specification steel or nickel cylinders as prescribed for any compressed gas except acetylene. Valves or fittings must be protected from injury by a metal cap or equally efficient device securely attached to the cylinder.

[29 FR 18700, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16069, Apr. 15, 1976; Amdt. 173-14, 45 FR 59889, Sept. 11, 1980; Amdt. 173-149, 46 FR 49894, Oct. 8, 1981; Amdt. 173-52, 46 FR 62455, Dec. 24, 1981]

§ 173.138 Pentaborane.

Specification steel or nickel cylinders prescribed for any compressed gas except acetylene are authorized. Each cylinder must be protected with a valve protection cap or must be packed in a strong wooden box and blocked therein so as to protect the valve from injury under conditions normally incident to transportation. Cylinders not exceeding 2 inches in diameter nor 6 inches in length, excluding the length of the valve, may also be packed in strong solid fiberboard boxes, having no outside dimension less than 4 inches, completely filled with layers of strong corrugated fiberboard, the center of which shall be cut out to fit the cylinder valve, and otherwise so designed that neither the cylinder nor the valve will be in contact with the wall of the box under conditions normally incident to transportation.

[Amdt. 173-52, 46 FR 62455, Dec. 24, 1981]

§ 173.139 Ethylene imine, inhibited, and propylene imine, inhibited.

(a) Ethylene imine and propylene imine must be inhibited and must be packed in specification containers as follows:

(1) Specification 15A, 15B, or 19B (§§ 178.168, 178.169, 178.191 of this subchapter). Wooden boxes with inside securely sealed glass ampules or glass bottles, contents not over 16 fluid ounces or 1-pound each, in tightly closed metal cans. If more than one ampule or bottle is packed in a metal can, ampules or bottles must be separated by fiberboard partitions. Ampules or bottles must be cushioned with sufficient incombustible cushioning material to completely absorb contents in event of leakage. Not more than 5 pints of liquid may be packed in any outside wooden box.

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[1] See footnote 1 in § 173.135.

(2) Specification 15A, 15B, 15C, or 19B (§§ 178.168, 178.169, 178.170, 178.191 of this subchapter). Wooden boxes with not more than four inside metal drums, Spec. 37B (§ 178.132 of this subchapter), not over 1-gallon capacity each, or not more than one Spec. 37B metal drum of 5 gallons capacity, in one outside box. Inside drums must be surrounded on all sides with incombustible absorbent cushioning material.

(3) Specification 6B, 6C, or 6J (§§ 178.98, 178.99, 178.100 of this subchapter). Metal barrels or drums, with one inside Specification 17E (§ 178.116 of this subchapter) metal drum not over 30 gallons capacity. Inside drum must be completely surrounded with incombustible cushioning material.

(4) Specification 104W, 105A100W, and 111A60W1 (§§ 179.100, 179.101, 179.200, 179.201 of this subchapter). Tank cars, for ethylene imine, inhibited only. Specification 111A60W1 tank cars must be insulated in accordance with § 179.200-4 of this subchapter.

(5) Spec. 5A (§ 178.81 of this subchapter). Metal barrels or drums not over 55-gallon capacity. Authorized for propylene imine, inhibited only.

(6) Specification 4B240, 4BA240, or 4BW240 (§§ 178.50, 178.51, 178.61 of this subchapter). Cylinders of all welded construction.

[29 FR 18700, Dec. 29, 1964, as amended by Order 71, 31 FR 9070, July 1, 1966. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.139, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.140 Zirconium, metallic, solutions, or mixtures thereof, liquid.

(a) Zirconium, metallic, solutions, or mixtures thereof, liquid, must be packed in specification containers as follows:

(1) Specification 15A, 15B, 15C, or 19B (§§ 178.168, 178.169, 178.170, 178.191 of this subchapter). Wooden boxes with inside metal containers. Each inside container shall not contain more than 20 individual glass or porcelain jars, not exceeding 2-ounce capacity each, securely closed and completely cushioned in incombustible cushioning material in sufficient quantity to completely absorb the contents in event of leakage.

[29 FR 18700, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16069, Apr. 15, 1976; Amdt. 173-149, 46 FR 49895, Oct. 8, 1981]

§ 173.141 Amyl mercaptan, butyl mercaptan, ethyl mercaptan, isopropyl mercaptan, propyl mercaptan, and aliphatic mercaptan mixtures.

(a) Amyl mercaptan, butyl mercaptan, ethyl mercaptan, isopropyl mercaptan, propyl mercaptan, and aliphatic mercaptan mixtures must be packed in specification containers as follows.

(1) Specification 15A, 15B, 15C, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with securely closed inside metal containers not over 5 gallons capacity each, or in tightly closed glass bottles not exceeding 1-quart capacity each, securely cushioned in incombustible cushioning material in sufficient quantity to completely absorb the contents in event of leakage.

(2) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes with securely closed inside metal containers not over 1 gallon capacity each; or in tightly closed glass bottles not exceeding 1 quart capacity each, securely cushioned in sufficient quantity of absorbent material to completely absorb the contents in event of leakage.

(3) Spec. 5, 5A, 5B, or 5C (§§ 178.80, 178.81, 178.82, or 178.83 of this subchapter). Metal barrels or drums, with not more than one opening not exceeding 2.3 inches in diameter and not more than one vent opening not exceeding 1 inch in diameter. Gaskets are required and must be not less than $^{3}/_{32}$-inch thick and of resilient material such as polyethylene, neoprene, or equally efficient material.

(4) Spec. 17C (§ 178.115 of this subchapter). Metal drums (single-trip), with not more than one opening not exceeding 2.3 inches in diameter and not more than one vent opening not exceeding 1 inch in diameter. Gaskets are required and must be not less than $^{3}/_{32}$-inch thick and of resilient material

such as polyethylene, neoprene, or equally efficient material.

(5) Spec. 17E (§ 178.116 of this subchapter). Metal drums (single-trip), not over 5 gallons capacity, without opening except bung hole not exceeding 2.3 inches in diameter. Gaskets are required and must be not less than $^{3}/_{32}$-inch thick and of resilient material such as polyethylene, neoprene, or equally efficient material. (See also paragraph (a)(6) of this section.)

(6) Spec. 17E (§ 178.116 of this subchapter). Metal drums (single-trip), not over 55 gallons capacity, with not more than one opening not exceeding 2.3 inches in diameter and not more than one vent opening not exceeding 1 inch in diameter. Gaskets are required and must be not less than $^{3}/_{32}$-inch thick and of resilient material such as polyethylene, neoprene, or equally efficient material. Authorized only for mercaptans having flash point above 20° F.

(7) Specification 103W, 105A100,[1] 105A100W, 105A200ALW, 106A500X, 110A500W, 111A60F1, 111A60W1, 112A200W, 112A400F, or 114A340W (§§ 179.100, 179.101, 179.200, 179.201 of this subchapter). Tank cars. Specifications 103W, 111A60F1, 111A60W1, and 114A340W tank cars must not be equipped with any bottom outlet. Bottom washout permitted. Specification 105A200ALW is authorized for ethyl mercaptan only and is not authorized for transportation by water.

(8) Specification MC 330 or MC 331 (§ 178.337 of this subchapter). Tank motor vehicles. Tank bottom outlets must be equipped with valves conforming with § 178.337-11(c) of this subchapter.

(9) Specification steel or nickel cylinders as prescribed for any compressed gas except acetylene.

(10) Specification 51 (§ 178.245 of this subchapter). Portable tank. Each tank must be equipped with safety relief valves which must be in compliance with all requirements of § 173.315(i). A tank must not be liquid full at 130° F.

(11) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter) are authorized under conditions specified in the IM Tank Table.

(b) Warning or odorizing devices containing not more than one ounce of a mercaptan or an aliphatic mercaptan mixture in a hermetically sealed container or in a hermetically sealed portion of the device are not subject to the regulations in Parts 170-189 and 397 of this title.

[29 FR 18700, Dec. 29, 1964. Redesignated 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.141, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.143 Methylchloromethyl ether, anhydrous.

(a) Methylchloromethyl ether, anhydrous, must be packed in specification containers as follows:

(1) Spec. 5K (§ 178.88 of this subchapter). Nickel barrels or drums.

(2) Specification 15A, 15B, 15C, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside glass or earthenware containers not over 1-gallon capacity each, except that inside containers up to 3 gallons each are authorized when only one inside container is packed in each outside box.

(3) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter) are authorized under conditions specified in the IM Tank Table.

[29 FR 18700, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.143, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.144 Ink (flammable liquid).

(a) Except as otherwise provided in this part, ink which is classed as a flammable liquid in this subchapter must be packaged as follows:

(1) In containers as prescribed in § 173.119, according to flash point, pressure, or viscosity.

(2) Spec. 17C (§§ 178.115 of this subchapter). Full removable head metal drums (single-trip).

(3) Specification 37C (§ 178.135 of this subchapter). Metal drums (non-re-

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[1] Use of existing tank cars authorized, but new construction not authorized.

usable container) not over 5 gallons capacity each. Authorized only for material having flash point over 20° F. Not authorized for transportation by air.

(b) Ink in glass packagings not over 1 quart capacity each, or in metal packagings not over 5 gallons capacity each, further overpacked in a strong outide packaging is excepted from the specification packaging requirements of this part.

[29 FR 18700, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

Editorial Note: For Federal Register citations affecting § 173.144, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.145 Dimethylhydrazine, unsymmetrical, and methylhydrazine.

(a) Dimethylhydrazine, unsymmetrical, and methylhydrazine must be packed in specification containers as follows:

(1) Specification 1D or 1M (§§ 178.4, 178.17 of this subchapter). Glass carboys in boxes or expanded polystyrene packagings. Not authorized for transportation by aircraft.

(2) Specification 15A, 15B, 15C, or 19B (§§ 178.168, 178.169, 178.170, 178.191 of this subchapter). Wooden boxes with inside glass bottles not exceeding 1-gallon capacity each, cushioned by means of vermiculite within tin cans which shall be tightly closed, or containers not over 2 quarts capacity each made of aluminum not less than 0.04 inch thick. Closures and gaskets must be of material which will not react dangerously with or be decomposed by contact with the contents.

(3) Spec. 5, 5A, or 5C (§ 178.80, § 178.81, or § 178.83 of this subchapter); or 17E (§ 178.116 of this subchapter) (single-trip). Metal barrels or drums which shall be of type 304 or 347 stainless steel, with openings not exceeding 2.3 inches in diameter.

(4) Spec. 17C (§ 178.115 of this subchapter). Metal barrels or drums (single-trip) with openings not exceeding 2.3 inches in diameter. Authorized only for dimethylhydrazine, unsymmetrical.

(5) Spec. 42B (§ 178.107 of this subchapter). Aluminum drums. Authorized only for dimethylhydrazine, unsymmetrical.

(6) Specification 103W, 103CW, 105A100W, 111A60W1, 111A60W7, or 111A100W4 (§§ 179.100, 179.101, 179.200, 179.201 of this subchapter). Tank cars.[1] Authorized for dimethylhydrazine, unsymmetrical only. Each tank car must be equipped with steel safety valves of approved design and any 103W or 111A * * * tank car must not be equipped with any bottom outlet. Bottom washout permitted. Specification 105A200W, 105A300W, 105A400W, 105A500W, and 105A600W (§§ 179.100, 179.101 of this subchapter) tanks must be restenciled 105A100W and be equipped with safety valves of the type and size used on specification 105A100W tank cars.

(7) Specification MC 300, MC 301, MC 302, MC 303, MC 304, MC 305, MC 306, MC 307, MC 310, MC 311, or MC 312 (§§ 178.341, 178.342, 178.343 of this subchapter). Tank motor vehicle without bottom discharge outlets and equipped with steel safety valves of approved design.

(8) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter) are authorized under conditions specified in the IM Tank Table.

[29 FR 18700, Dec. 29, 1964, as amended by Order 73, 32 FR 3455, Mar. 2, 1967. Redesignated at 32 FR 5606, Apr. 5, 1967]

Editorial Note: For Federal Register citations affecting § 173.145, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.146 Heaters for refrigerator cars, flammable liquid fuel type.

(a) Heaters of the liquid fuel type for refrigerator cars, containing flammable liquid fuel, may be shipped in carload or truckload lots provided each heater shall have been inspected to see that flame has been extinguished, that there is no leakage of fuel, and that controls are in the "off" position. Heaters shall be loaded and braced so as to prevent falling, tipping, or mechanical damage under normal conditions incident to transportation.

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[1] The use of existing tank cars authorized but new construction not authorized.

(b) Heaters of the liquid fuel type for refrigerator cars must have their flammable liquid fuel tanks completely drained if offered for transportation or transported in less-than-carload or less-than-truckload lots.

[29 FR 18700, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16069, Apr. 15, 1976]

§ 173.147 Methyl vinyl ketone, inhibited.

(a) Methyl vinyl ketone must be inhibited and must be packed in specification containers as follows:

(1) As prescribed in § 173.119 (a) or (b).

(b) Limited quantities of inhibited methyl vinyl ketone, in a glass or metal inside container having a capacity of no more than 4 fluid ounces with no more than one such container securely closed and efficiently cushioned in a strong outside packaging, is excepted from labeling and the specification packaging requirements of this subpart (except that labeling is required for transportation by air). In addition, shipments are not subject to Subpart F of Part 172 of this subchapter, to Part 174 of this subchapter except § 174.24 and to Part 177 of this subchapter except § 177.817.

[29 FR 18700, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.147, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.148 Monoethylamine.

(a) Monoethylamine must be packed in specification containers as follows:

(1) Specification 5, 5A, or 5P (§§ 178.80, 178.81, 178.92 of this subchapter). Metal barrel or drum equipped with openings not exceeding 2.3 inches in diameter. Bung labels must be applied and must meet the requirements prescribed in § 173.119(i).

(2) Cylinders as prescribed for any compressed gas except acetylene.

(3) Tank cars prescribed in § 173.119(f)(3).

(4) Specification 106A500X or 110A500W (§§ 179.300, 179.301 of this subchapter) tanks. Authorized only for transportation by rail freight and by highway. (See §§ 174.560 and 177.834(m) of this subchapter for special requirements.)

(5) Tank motor vehicles as prescribed in § 173.119(f)(5).

(6) Specification 51 (§ 178.245 of this subchapter). Portable tanks. Tanks must have no bottom opening, except one 3-inch maximum plugged opening for maintenance purposes is authorized.

(b) Solution of monoethylamine in water which has a vapor pressure not exceeding 16 pounds per square inch absolute at 100° F. may be shipped in containers prescribed by § 173.119(d).

[29 FR 18700, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.148, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.149 Methyl magnesium bromide in ethyl ether in concentrations not over 40 percent.

(a) Methyl magnesium bromide in ethyl ether in concentrations not over 40 percent must be packed in specification containers as follows:

(1) As prescribed in § 173.134.

(2) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes with inside glass bottles not over 1 quart capacity each. Inside containers must be surrounded on all sides with dry absorbent noncombustible material in quantity sufficient to absorb entire contents. Authorized gross weight not over 65 pounds.

(3) Spec. 17C (§ 178.115 of this subchapter). Metal drums (single-trip) with openings not exceeding 2.3 inches in diameter.

[Order 66, 30 FR 5744, Apr. 23, 1965. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16069, Apr. 15, 1976; Amdt. 173-142, 45 FR 81571, Dec. 11, 1980]

§ 173.149a Nitromethane.

Nitromethane must be packaged as specified in § 173.119(b) except that shipment in cargo tanks, tank cars, portable tanks, and any container having a capacity greater than 110 gallons is forbidden.

[Amdt. 173-94, 41 FR 16069, Apr. 15, 1976]

Subpart E—Flammable Solids, Oxidizers, and Organic Peroxides; Definitions and Preparation

SOURCE: 29 FR 18709, Dec. 29, 1964, unless otherwise noted. Redesignated at 32 FR 5606, Apr. 5, 1967.

§ 173.150 Flammable solid; definition.

For the purpose of this subchapter, "Flammable solid" is any solid material, other than one classed as an explosive, which, under conditions normally incident to transportation is liable to cause fires through friction, retained heat from manufacturing or processing, or which can be ignited readily and when ignited burns so vigorously and persistently as to create a serious transportation hazard. Included in this class are spontaneously combustible and water-reactive materials.

[Amdt. 173-94, 41 FR 16069, Apr. 15, 1976, as amended by Amdt. 173-94A, 41 FR 40681, Sept. 20, 1976]

§ 173.151 Oxidizer; definition.

An oxidizer for the purpose of this subchapter is a substance such as a chlorate, permanganate, inorganic peroxide, or a nitrate, that yields oxygen readily to stimulate the combustion of organic matter.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 173-94, 41 FR 16069, Apr. 15, 1976, as amended by Amdt. 173-124, 44 FR 31184, May 31, 1979]

§ 173.151a Organic peroxide; definition.

(a) An organic compound containing the bivalent —0—0— structure and which may be considered a derivative of hydrogen peroxide where one or more of the hydrogen atoms have been replaced by organic radicals must be classed as an organic peroxide unless:

(1) The material meets the definition of an explosive A or explosive B, as prescribed in Subpart C of this part, in which case it must be classed as an explosive,

(2) The material is forbidden to be offered for transportation according to § 172.101 or § 173.21 of this subchapter,

(3) It is determined that the predominant hazard of the material containing an organic peroxide is other than that of an organic peroxide, or

(4) According to data on file with the Research and Special Programs Administration, it has been determined that the material does not present a hazard in transportation.

[Amdt. 173-94A, 41 FR 40681, Sept. 20, 1976, as amended by Amdt. 173-137, 45 FR 34703, May 22, 1980]

§ 173.152 Packing.

(a) Flammable solids or oxidizing materials must not be packed in the same outside container with corrosive liquids unless the corrosive liquids are in bottles, cushioned by incombustible absorbent material, in tightly closed metal containers.

NOTE 1: Oxidizing or other materials in quantity not exceeding 4 ounces, in securely closed metal cans, packed in the same compartment with other securely packed materials necessary for a complete fumigant, are acceptable for transportation.

(b) Closing and cushioning. All containers must be tightly and securely closed. Inside containers must be cushioned as prescribed or in any case when necessary to prevent breakage or leakage.

§ 173.153 Limited quantities of flammable solids, oxidizers and organic peroxides.

(a) Limited quantities of flammable solids for which exceptions are permitted as noted by reference to this section in § 172.101 of this subchapter, are excepted from labeling (except when offered for transportation by air) and specification packaging requirements when packed according to the following paragraph. In addition, shipments are not subject to Subpart F of Part 172 of this subchapter, to Part 174 of this subchapter except § 174.24 and to Part 177 of this subchapter except § 177.817.

(1) Flammable solids in inside containers not over 1 pound net weight each, in outside containers not exceeding 25 pounds net weight each.

(b) Limited quantities of oxidizers and organic peroxides for which exceptions are permitted as noted by reference to this section in § 172.101 of

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this subchapter are excepted from labeling (except when offered for transportation by air) and specification packaging requirements when packed according to the following paragraphs. In addition, shipments are not subject to Subpart F of Part 172 of this subchapter, to Part 174 of this subchapter except § 174.24 and to Part 177 of this subchapter except § 177.817.

(1) Oxidizers in inside containers having a rated capacity of not over one pint for liquids or a net weight of not over one pound for solids, in strong outside packagings not exceeding 25 pounds net weight each.

(2) Organic peroxides, except acetyl benzoyl peroxide and benzoyl peroxide, as follows:

(i) In inside containers which must be securely packed and cushioned with noncombustible cushioning material (except that cushioning material is not required when the liquid is contained in strong, securely closed plastic packagings of not over 1 ounce by volume capacity each), further overpacked in strong outside packagings containing not over 1 pint or 1 pound net weight of the material.

(ii) In not more than 24 inside fiberboard containers each having not more than 70 securely closed tubes having a maximum fluid capacity each of ⅛-ounce and securely packed in non-combustible cushioning material.

(c) Special exceptions for shipment of certain flammable solids, oxidizers and organic peroxides in the ORM-D Class are provided in Subpart N of this part.

[Amdt. 173-94, 41 FR 16069, Apr. 15, 1976, as amended by Amdt. 173-94A, 41 FR 40681, Sept. 20, 1976; Amdt. 173-121, 43 FR 48643, Oct. 19, 1978; Amdt. 173-142, 45 FR 81571, Dec. 11, 1980]

§ 173.154 Flammable solids, organic peroxide solids and oxidizers not specifically provided for.

(a) Flammable solids, organic peroxide solids and oxidizers as defined in §§ 173.150 and 173.151, other than those for which special packing requirements are prescribed, must be packed in specification containers of a design and constructed of materials that will not react dangerously with or be decomposed by the chemical packed therein. Specific packaging requirements are as follows:

(1) Specification 6B or 6C (§ 178.98 or § 178.99 of this subchapter). Metal barrels or drums.

(2) Spec. 17C, 17E, 17H, 37A or 37B (§§ 178.115, 178.116, 178.118, 178.131, or 178.132 of this chapter), metal drums (single-trip).

(3) Specification 57 (§ 178.253 of this subchapter). Portable tanks. Tanks must have a fusible plug having a fusing temperature between 70° C and 90° C. Authorized only for dicumyl peroxide, dry and a, a'-bis(t-butylperoxy) diisopropyl-benzene, solid.

(4) Specification MC 303, MC 304, MC 306, MC 307, MC 311 or MC 312 (§§ 178.341, 178.342, 178.343 of this subchapter). Tank motor vehicles. Tanks must conform with § 178.340-8. Discharge valves must be located inside the tank or at a point outside the tank where the line enters or leaves the tank. The valve seat must be located inside the tank or within the welded flange, its companion flange, nozzle, or coupling. Each product discharge opening shall have a secondary closing means, remote from tank filling or discharge openings, for operation in event of fire or other accident. Tanks may have heating coils if an inorganic heating medium is used. Authorized only for sodium perchlorate or magnesium perchlorate, wet, with 10 percent or more of water, equally distributed within the cargo tank. Specification MC 311 and MC 312 also authorized for potassium nitrite solution. Only Specification MC 304 and MC 307 are authorized for transportation by vessel.

(5) Specification 56 (§ 178.252 of this subchapter). Metal portable tank. Authorized only for flammable solids (including water reactive materials) and dry oxidizers.

(6) Spec. 12B (§ 178.205 of this chapter). Fiberboard boxes with inside containers which must be metal cans; sliding-lid wooden boxes; fiber cans or boxes, Spec. 2G (§ 178.26 of this chapter), not over 5 pounds capacity each; or glass bottles not over 1 pound capacity each. Packages containing glass containers must not weigh over 65 pounds gross.

(7) Spec. 15A or 15B (§§ 178.168 or 178.169 of this subchapter). Wooden boxes lined, Spec. 2F or 2M (§§ 178.25 or 178.31 of this subchapter).

(8) Specification 15A, 15B, 15C, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside containers.

(9) Specification 21C (§ 178.224 of this subchapter). Fiber drums. Maximum net weight may not exceed 225 pounds except that a 21C400 fiber drum may have a net weight not exceeding 350 pounds.

(10) Spec. 22A (§ 178.196 of this subchapter). Plywood drums.

(11) Spec. 22B (§ 178.197 of this subchapter). Plywood drums with inside metal drums, Spec. 2F (§ 178.25 of this subchapter).

(12) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes constructed of at least 275-pound test double-faced fiberboard and provided with a perimeter liner and bottom pad of at least 200-pound test fiberboard. Boxes constructed of at least 350-pound fiberboard having top and bottom pads shall not require perimeter liner. Product must be contained within a tightly closed polyethylene or other equally efficient plastic bag constructed of material having minimum thickness of 0.004 inch. Not more than 25 pounds net weight of product may be packed in one outside box.

(13) Spec. 12A (§ 178.210 of this subchapter). Fiberboard boxes with inside glass bottles not over 5 pounds capacity each. Not more than four bottles having capacity of 5 pounds each, shall be packed in one outside container. Shipper must have established that completed package meets test requirements prescribed by § 178.210-10 of this subchapter.

(14) Specification 12B (§ 178.205 of this subchapter). Fiberboard boxes with inside polyethylene bottles not over 1-gallon capacity each or polyethylene jars not over 9 pints capacity each. Each jar shall contain not more than 10 pounds net weight of product. Not more than four bottles or jars may be packed in one outside container. Authorized only for materials which will not cause decomposition of polyethylene or container failure.

(15) Specification 103,[1] W, 111A60W1, or 111A60F1 (§§ 179.200, 179.201 of this subchapter). Tank cars. Authorized only for sodium perchlorate or magnesium perchlorate wet with 10 percent or more water equally distributed.

(16) Specification 35 (§ 178.16 of this subchapter) non-reusable, removable head polyethylene drum for use without overpack and not over seven gallons capacity. Authorized only for dry or paste material that will maintain its form to a minimum temperature of 130° F.

(17) Specification 103ALW or 111A60ALW (§§ 179.200, 179.201 of this subchapter). Insulated tank cars designed for operation at temperatures up to 250° F. Authorized only for ammonium nitrate with 15 percent or more water in solution at a maximum temperature of 240° F. Transportation by water is not authorized.

(18) Specification MC 307 or MC 311 (§§ 178.340, 178.342 of this subchapter). Insulated tank motor vehicles designed for operation at temperatures up to 250° F. Authorized only for ammonium nitrate with 15 percent or more water in solution at a maximum temperature of 240° F. Transportation by water is not authorized.

(19) Specification 6D or 37M (§§ 178.102, 178.134 of this subchapter). Cylindrical steel overpacks (non-reusable containers) with inside specification 2S, 2SL, or 2U (§§ 178.35, 178.35a, 178.24 of this subchapter) polyethylene packaging.

(20) As prescribed in § 173.163(a)(7). Authorized only for ammonium persulfate, hydrated calcium hypochlorite, potassium persulfate, sodium carbonate peroxide, sodium chlorate, dry, sodium perborate monohydrate and sodium persulfate.

(21) Specification 105A200ALW (§§ 179.100, 179.101 of this subchapter). Tank cars. Authorized only for a mixture of 24 to 26 percent ammonia, 68 to 70 percent ammonium nitrate and 5 to 7 percent water. Transportation by water is not authorized.

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[1] The use of existing tanks authorized but new construction not authorized.

(22) Specification 44P (§ 178.241 of this subchapter). All plastic bags. Authorized only for ammonium persulfate, potassium persulfate, sodium carbonate peroxide, sodium perborate monohydrate and sodium persulfate. Net weight may not exceed 81 pounds.

(23) Specification 44B or 44C (§§ 178.236, 178.237 of this subchapter). Multiwall paper bags. Authorized only for ammonium persulfate, dibasic lead phosphite, potassium persulfate, sodium carbonate peroxide, sodium perborate monohydrate and sodium persulfate.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[29 FR 18709, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.154, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.154a Fusees.

(a) A fusee is a device designed to burn at a controlled rate and to produce visible effects for signaling purposes. It consists of a pasteboard or fiber tube containing a colored flare mixture and with or without a means of support. The composition of the fusee must be such that spontaneous ignition does not occur when the moistened composition is exposed to a temperature of 212° F. for 72 consecutive hours. Fusees must have individual tip, head, or similar ignition point or surface entirely covered and securely protected against accidental contact or friction. Fusees must be securely packed in packages complying with the following specifications:

(1) Specifications 15A, 15B, 15C, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes having a gross weight not to exceed 150 pounds for specification 19B boxes; 200 pounds for the other boxes. When specification 15C boxes are used, devices must be packed in airtight inside metal receptacles.

(2) Specification 12B (§ 178.205 of this subchapter) fiberboard boxes. Boxes must have reinforced ends proven to be capable of preventing penetration of spikes through the outside box when a sample package, prepared as for shipment, is subjected to two drops from a height of 4 feet onto a solid surface. The package must be dropped so as to strike diagonally with the spikes in a downward position. Gross weight not to exceed 65 pounds except that gross weight not to exceed 75 pounds is authorized in boxes made in accordance with § 178.205-24 of this subchapter.

(3) Specification 29 (§ 178.226 of this subchapter). Mailing tubes, provided the penetration of the spikes of the fusees through the outside container is prevented by the method specified for fiberboard boxes, specification 12B, in paragraph (a)(2) of this section. Gross weight not to exceed 5 pounds.

(4) Fusees without spikes when offered for shipment may be packed in packages prescribed in this paragraph, omitting the protection required for these devices when equipped with spikes.

(5) Fusees may be packed with nonexplosive or nonflammable articles provided the outside packages are marked as prescribed in this section.

(b) Each outside package must be plainly marked in letters not less than seven-sixteenths inch in height "Fusees" and with the additional words "Handle Carefully—Keep Fire Away."

[Amdt. 173-56, 36 FR 21201, Nov. 4, 1971, as amended by Amdt. 173-94, 41 FR 16070, Apr. 15, 1976]

§ 173.156 Barium peroxide and calcium peroxide.

(a) Barium peroxide and calcium peroxide must be packed in specification containers as follows:

(1) Specification 15A, 15B, 15C, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside glass containers not over 1-pound capacity each; or with inside glass containers not over 5 pounds capacity each, cushioned with incombustible cushioning material; or with inside metal containers or lining, Spec. 2F (§ 178.25 of this subchapter).

(2) [Reserved]

(3) Spec. 6B or 6C (§§ 178.98 or 178.99 of this subchapter). Metal bar-

rels or drums with not more than 1400 pounds net weight in each container.

(4) Spec. 17E, 17H, 37A, or 37B (§§ 178.116, 178.118, 178.131, or 178.132 of this subchapter). Metal drums (single-trip).

(5) Spec. 21C (§ 178.224 of this subchapter). Fiber drums. Authorized net weight not over 225 pounds.

[29 FR 18709, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16070, Apr. 15, 1976; Amdt. 173-14, 45 FR 59889, Sept. 11, 1980; Amdt. 173-149, 46 FR 49895, Oct. 8, 1981]

§ 173.157 Benzoyl peroxide, chlorobenzoyl peroxide (para), cyclohexanone peroxide, dimethylhexane dihydroperoxide, lauroyl peroxide, or succinic acid peroxide, wet.

(a) Benzoyl peroxide, chlorobenzoyl peroxide (para), dimethylhexane dihydroperoxide, lauroyl peroxide, and succinic acid peroxide, each wet with at least 30 percent of water by weight, and cyclohexanone peroxide over 50 percent concentration but not exceeding 85 percent concentration, wet, must be packed in specification packagings as follows:

(1) Specification 15A, 15B, 15C, or 19B, (§§ 178.168, 178.169, 178.170, 178.191 of this subchapter). Wooden boxes with inside metal containers or lining. Specification 2F (§ 178.25 of this subchapter), or with securely closed inside paper bags lined with polyethylene at least 0.002 inch thick, or with inside aluminum drums of at least 16 gage metal throughout. Net weight (dry weight) in each inside DOT-2F metal container or in each paper bag may not exceed 1-pound. Gross weight may not exceed 200 pounds.

(2) [Reserved]

(3) Specification 12B (§ 178.205 of this subchapter). Fiberboard box with inside fiber containers securely closed by taping or gluing, or with securely closed inside paper bags lined with polyethylene at least 0.002 inch thick. The net weight (dry weight) in each inside container may not exceed 1 pound. Except for lauroyl peroxide, wet, each inside container must be surrounded by an appropriate fire-resistant cushioning material. The gross weight in Specification 12B65 fiberboard boxes may exceed 65 pounds, but may not exceed 80 pounds, provided the net weight (dry weight) of the contents does not exceed 50 pounds.

(4) Specification 21C (§ 178.224 of this subchapter). Fiber drum with securely closed inside plastic containers made of polyethylene film at least 0.002 inch thick for cyclohexanone peroxide over 50 percent concentration but not exceeding 85 percent concentration and for dimethylhexane dihydroperoxide; with securely closed inside plastic containers made of polyethylene film at least 0.004 inch thick for benzoyl peroxide wet with at least 30 percent of water by weight. Authorized net weight (wet weight) in one outside drum may not exceed 50 pounds for cyclohexanone peroxide, 100 pounds for dimethylhexane dihydroperoxide, or 225 pounds for benzoyl peroxide.

(5) Specification 12B (§ 178.205 of this subchapter). Fiberboard box with securely closed inside plastic containers made of polyethylene film at least 0.004 inch thick. The net weight (dry weight) in each inside container may not exceed 25 pounds. Each inside container must be surrounded by an appropriate fire-resistant cushioning material. Authorized only for benzoyl peroxide.

(b) Benzoyl peroxide, wet with at least 20 percent of water by weight, must be packed in specification packagings as follows:

(1) Specification 12B (§ 178.205 of this subchapter). Fiberboard box with securely closed inside paper bags lined with polyethylene at least 0.002 inch thick. The net weight (dry weight) in each bag may not exceed 1 pound. Each bag must be surrounded by an appropriate fire-resistant cushioning material.

(2) Specification 21C (§ 178.224 of this subchapter). Fiber drum with securely closed inside plastic containers made of polyethylene film at least 0.004 inch thick. Net weight (dry weight) in each outside drum may not exceed 55 pounds.

(3) Specification 12B (§ 178.205 of this subchapter). Fiberboard box with securely closed inside plastic containers made of polyethylene film at least 0.004 inch thick. The net weight (dry

weight) in each inside container may not exceed 25 pounds. Each inside container must be surrounded by an appropriate fire-resistant cushioning material. The net weight (dry weight) in each outside box may not exceed 50 pounds.

[29 FR 18709, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

Editorial Note: For Federal Register citations affecting § 173.157, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.158 Benzoyl peroxide, dry; chlorobenzoyl peroxide (para) dry; cyclohexanone peroxide, dry; lauroyl peroxide, dry; or succinic acid peroxide, dry.

(a) Benzoyl peroxide, dry; chlorobenzoyl peroxide (para), dry; cyclohexanone peroxide over 50 percent concentration but not exceeding 85 percent concentration, dry; lauroyl peroxide, dry; or succinic acid peroxide, dry; must be packed in specification packagings as follows:

(1) Specification 15A, 15B, 19A, or 19B (§§ 178.168, 178.169, 178.190, 178.191 of this subchapter). Wooden boxes with inside fiber containers securely closed by taping or gluing, or inside securely closed paper bags lined with 0.002 inch thick polyethylene, not over 1-pound capacity each. Except for lauroyl peroxide, dry, each inside container must be surrounded by an appropriate fire-resistant cushioning material. The net weight in outside container must not exceed 50 pounds, except that for lauroyl peroxide, dry, a net weight not over 100 pounds is authorized.

(2) Spec. 21C (§ 178.224 of this subchapter) fiber drums. Authorized only for lauroyl peroxide, dry. Authorized net weight not over 100 pounds in one drum.

(3) Specification 12B (§ 178.205 of this subchapter). Fiberboard boxes, with inside fiber containers securely closed by taping or gluing, or inside securely closed paper bags lined with polyethylene not less than 0.002 inch thick, not over 1 pound capacity each. Except for lauroyl peroxide, dry, each inside container must be surrounded by an appropriate fire-resistant cushioning material. The gross weight in Specification 12B65 boxes may be more than 65 pounds, but not more than 80 pounds, provided the net weight of contents does not exceed 50 pounds.

[29 FR 18709, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

Editorial Note: For Federal Register citations affecting § 173.158, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.159 Burnt cotton.

(a) "Burnt cotton" is cotton that has been on fire and from which the burnt portions have not been removed by repicking. It must not be offered for transportation until at least 10 days have elapsed since the last evidence of fire in it.

(b) When burnt cotton is picked and baled, the separated unburnt cotton is subject to the same regulations as cotton that has not been involved in a fire. See § 172.101 of this subchapter.

[Amdt. 173-94, 41 FR 16070, Apr. 15, 1976]

§ 173.160 Calcium chlorite and sodium chlorite.

(a) Calcium chlorite and sodium chlorite must be packed in specification containers as follows:

(1) Specification 15A, 15B, 15C, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside glass or earthenware containers not over 2¼ pounds capacity each or metal not over 5 pounds capacity each.

(2) Specification 6B or 6C (§§ 178.98, 178.99 of this subchapter). Metal barrels or drums.

(3) Spec. 17E, 17H, 37A, or 37B (§§ 178.116, 178.118, 178.131 or § 178.132 of this subchapter). Metal drums (single-trip).

[29 FR 18709, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16070, Apr. 15, 1976; Amdt. 173-14, 45 FR 59889, Sept. 11, 1980; Amdt. 173-149, 46 FR 49896, Oct. 8, 1981]

§ 173.161 Calcium phosphide.

(a) Calcium phosphide must be packed in specification containers as follows:

(1) Specification 15A, 15B, or 19B (§§ 178.168, 178.169, or 178.191 of this

subchapter). Wooden boxes, lined, Spec. 2F (§ 178.25 of this subchapter), and with hermetically sealed inside containers.

(2) Specifications 6B, or 6C (§ 178.98, or § 178.99 of this subchapter). Metal barrels or drums.

[29 FR 18709, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16070, Apr. 15, 1976; Amdt. 173-14, 45 FR 59889, Sept. 11, 1980; Amdt. 173-149, 46 FR 49896, Oct. 8, 1981]

§ 173.162 Charcoal.

(a) "Limited quantities of charcoal, as described in this paragraph, are excepted from labeling (except when offered for transportation by air) and specification packaging requirements of this subchapter. In addition, shipments are not subject to Subpart F of Part 172 of this subchapter, to Part 174 of this subchapter except § 174.24 and to Part 177 of this subchapter except § 177.817.

(1) [Reserved]

(2) Charcoal made from pine wood and processed so that it is not liable to heat dangerously or cause fires in transportation.

(3) Charcoal briquettes made from wood charcoal with starch and water, or tar, for a binder, which have been screened and cooled to a temperature below 100° F., before being offered for transportation.

(4) Charcoal screenings made from "pinon" wood.

(5) Charcoal made from walnut shells, corn cobs, peach pits, and similar material, must be cooled and held not less than five days before shipment, and shipped in bags, barrels, or boxes. The five-day holding period shall not apply to charcoal briquettes screened and cooled to a temperature below 100° F. before being offered for transportation.

(6) Charcoal, lump, made by the old kiln or pit method by which long air exposure is provided before shipment.

(7) Charcoal, wood, except charcoal screenings, when packed in boxes or barrels.

(8) Charcoal, wood, when in bags in less-than-carload or less-than-truckload shipments of not exceeding 2,000 pounds.

(9) When offered for transportation by air, charcoal must be packaged in boxes or barrels.

(10) Charcoal screenings or ground, crushed, granulated, or pulverized charcoal, from pit or kiln burned charcoal, provided the screenings or the material from which the ground charcoal is made has been exposed to the air for not less than 5 days prior to shipment or grinding (see paragraphs (j) and (k) of this section).

(11) Special exceptions for shipment of charcoal in the ORM-D class are provided in Subpart N of this part.

(b) Charcoal made in round retorts must be transferred to air-tight metal cans for cooling, and must be kept in these cans for 24 hours or more. The charcoal after removal from these cans should be aired by spreading on a floor to a depth not exceeding 1 foot. This air exposure must last not less than 44 hours. Not less than 72 hours should elapse from the time the air exposure of the charcoal commences before a car loaded with it is closed for shipment, or before the lump charcoal is placed in paper bags.

(1) The charcoal during this airing period must be protected from the weather, and exposed to good circulation of air. When the charcoal is aired on the floor for only 24 hours and then placed in burlap bags, it must be kept in the bags 60 hours before shipment. If the charcoal is not aired on the floor for at least 24 hours, it must be kept in the burlap bags for at least 96 hours before loading for shipment.

(c) Charcoal made in ovens in slatted cars should be kept for two periods of 24 hours each in first and secondary airtight cooling chambers respectively. After removing the charcoal from the secondary coolers it must be exposed to good air circulation, but protected from the weather for a period of not less than 44 hours.

(1) Not less than 72 hours must elapse from the time the air exposure of the charcoal commences before a car loaded with it is closed for shipment, or before the lump charcoal is placed in paper bags.

(d) When fire occurs in charcoal during air exposure period, it should be extinguished with as little water as possible. Any charcoal wet in this way or otherwise must be dried, by again heating in the retorts or ovens, and cooled and aired in the usual way described in paragraphs (b) and (c) of this section, or the charcoal must be set aside and allowed to dry for not less than 30 days before shipment.

(e) Charcoal, lump, must be dry and free from screenings and brands.

(1) Shipments must be loaded into tight box cars, tight container cars, or into tight closed-top hopper cars, except that lump charcoal made from soft wood may be shipped in open or stock cars.

(2) When a chute is used in loading the car, the chute must contain a properly constructed screen which must be kept clean. This screen shall be not less than ¾ inch mesh. Forks with prongs not less than 1 inch apart must be used instead of shovels to handle the charcoal. The screenings which accumulate in the doorway of the car must be removed before loading the doorway. The car should be swept before loading, and a car which has contained lime must be thoroughly cleaned before loading with charcoal. The doors of the car must be closed tightly before the car is forwarded.

(3) Lump charcoal may be shipped in bags, barrels or boxes, or bulk in cars.

(4) Lump charcoal, dry and free from screenings and brands, may be shipped in bulk in motor vehicles. Vehicle must be swept before loading and if it contained lime it must be thoroughly cleaned.

(f) Charcoal screenings consist of small pieces of charcoal varying from about one-half inch in the maximum dimension to grains of dust. These screenings are more liable to produce fires than other forms of charcoal. Charcoal screenings from wet charcoal or wet screenings or screenings which have been wet must not be offered for shipment unless they have been dried for not less than 12 hours in a retort or oven, and then subjected to not less than 10 days airing and cooling before shipment.

(1) Charcoal screenings must be stored in a dry place, in loosely piled bags, freely exposed to the air for not less than 20 days after separation from the lump before shipment.

(2) Screenings from pine-wood charcoal must be stored as above described for not less than five days before shipment.

(3) Charcoal screenings must be packed in cotton or jute bags of not greater than 4 bushels capacity.

(g) Charcoal ground, crushed, granulated, or pulverized is prepared from either lump charcoal or screenings.

(1) Lump charcoal used for the preparation of ground, crushed, granulated, or pulverized charcoal must be stored subject to ventilation, and protected from the weather for not less than 20 days after its removal from the coolers before milling; or the ground, crushed, granulated or pulverized charcoal must be stored in bags, subject to ventilation and protected from the weather for not less than 20 days before shipment. Lump charcoal made from pine wood must be stored as above described for not less than 5 days before milling. Ground, crushed, or granulated charcoal made by the "Stafford" process must be stored subject to ventilation and protected from the weather for not less than 7 days before shipment in lieu of the 20-days' storage otherwise prescribed.

(2) Charcoal screenings used for the preparation of ground, crushed, granulated, or pulverized charcoal must be stored in a dry place in loosely piled cotton or jute bags freely exposed to air for a period of not less than 20 days after separation from the lump charcoal, and before milling; or the ground, crushed, granulated, or pulverized charcoal must be stored in bags, subject to ventilation and protected from the weather for not less than 20 days before shipment. Charcoal screenings made from pine wood charcoal must be stored as above described not less than 5 days before milling.

(3) Ground, crushed, granulated, or pulverized charcoal must be packed in tight sift-proof wooden barrels or boxes containing not more than 4 bushels each; or in fiberboard boxes; or in unlined jute bags, or in strong unlined cotton bags, containing not more than 4 bushels each; or in paper-lined jute bags, or in paper bags, containing not more than 2½ bushels each. Whenever practicable, all boxes,

barrels, or bags, after filling, should be allowed to remain open and freely exposed to the air, and protected from the weather for not less than 24 hours before being closed. Ground, crushed, granulated, or pulverized charcoal made from pine-wood charcoal should be so stored for not less than 72 hours before the packages are closed.

(h) Charcoal, screenings or ground, crushed, granulated or pulverized charcoal, in bags, when loaded in cars for shipment by rail must be so loaded that the bags are laid horizontally in the car, and so piled that there will be spaces for efficient air circulation. These spaces must be not less than 4 inches wide. If the bags are not compactly filled and closed so as to avoid free space within, transverse wooden strips must be laid between the bags and extending the full width of the car; these strips should be approximately 2 feet apart vertically and longitudinally. The bags must not be piled closer than 6 inches from the top of the car, and no more than 26,000 pounds of screenings, ground, granulated, crushed, or pulverized charcoal, shall be loaded in a 36-foot, 6-inch car; 27,000 pounds in a 37-foot, 6-inch car; 28,000 pounds in a 38-foot, 6-inch car; 29,000 pounds in a 39-foot, 6-inch car; 36,000 pounds in a 40-foot, 6-inch car; and 40,000 pounds in a 50-foot, 6-inch car. A tight car must be used, and any loose material must be swept up and removed from the doorway of the car before completing the loading.

(i) See § 177.838 of this subchapter for loading in motor vehicles.

(j) Charcoal burned in pits or kilns must be thoroughly cooled in the sealed kilns. After the kilns are opened, the charcoal must be allowed to stand in the open kiln or elsewhere exposed to the air for not less than 24 hours before loading in a freight car. Charcoal burned in kilns may be loaded in open cars or in box cars, but after loading in box cars, the cars must be allowed to stand not less than 24 hours with doors open before shipment.

(k) Screenings, or ground, crushed, granulated, or pulverized charcoal, from pit or kiln burned charcoal, are considered as non-hazardous, provided the screenings or the material from which the ground charcoal is made has been exposed to the air for not less than 5 days prior to shipment or grinding.

(l) Reburned charcoal must be cooled and exposed to good fresh-air circulation for not less than five days after removal from the reburning furnaces and before being shipped or ground to produce ground or pulverized charcoal.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[29 FR 18709, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16070, Apr. 15, 1976; Amdt. 173-94A, 41 FR 40681, Sept. 20, 1976; Amdt. 173-138, 45 FR 32695, May 19, 1980; Amdt. 173-169, 48 FR 52313, Nov. 17, 1983]

§ 173.163 Chlorate of soda, chlorate of potash, and other chlorates.

(a) Chlorate of soda, chlorate of potash, and other chlorates must be packed in specification containers as follows:

(1) Specification 6B, or 6C (§ 178.98 or § 178.99 of this subchapter). Metal barrels or drums.

(2) Spec. 17E, 17H, 37A, or 37B (§§ 178.116, 178.118, 178.131, or § 178.132 of this subchapter). Metal drums (single-trip).

NOTE 1: Specs. 37A and 37B. Metal drums for export service, marked for an authorized gross weight of 160 pounds, must be at least 24 gauge metal throughout.

(3) Spec. 21C, 22A, or 22B (§ 178.224, § 178.196 or § 178.197 of this subchapter). Fiber or plywood drums with inside metal drums, Spec. 2F (§ 178.25 of this subchapter). Authorized net weight not over 225 pounds.

(4) Specification 15A, 15B, 15C, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with tightly closed inside containers which must be of metal not over 10 pounds capacity each; or of glass not over 5 pounds each; or of fiber, Spec. 2G (§ 178.26 of this subchapter), not over 6 pounds capacity each.

(5) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes with inside metal cans not over 5 pounds capacity each, closed air tight and with not

over 25 pounds of chlorate in the outside container.

(6) Chlorates wet with 10 percent or more of water are authorized for shipment in tank cars, Spec. 103,[1] 103-W, 111A60-F-1, or 111A60-W-1 (§§ 179.200, 179.201 of this subchapter), when equally distributed therein.

(7) Chlorate of soda, dry, is authorized for shipment in aluminum or steel tank car tanks, cargo tank vehicles, tight sift-proof covered hopper cars, or tight sift-proof covered hopper type motor vehicles. Tank car tanks, cargo tank vehicles, hopper cars, and hopper type motor vehicles must be thoroughly cleaned before loading. Tank car tanks may have their internal operating valve removed provided the bottom outlet is securely capped.

(8) Specification 12A (§ 178.210 of this subchapter). Fiberboard box with inside glass or plastic bottles not over 5 pounds capacity each. Not more than 4 glass bottles or 6 plastic bottles having a capacity of 5 pounds each shall be packed in one outside container. Shipper must have established that completed package meets test requirements prescribed by § 178.210-10 of this subchapter.

(9) Specification 56 (§§ 178.251, 178.252 of this subchapter). Metal portable tanks.

[29 FR 18709, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

Editorial Note: For Federal Register citations affecting § 173.163, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.164 Chromic acid or chromic acid mixture, dry.

(a) Chromic acid and chromic acid mixture, dry, must be packaged as follows:

(1) Specification 6B, or 6C (§ 178.98 or § 178.99 of this subchapter). Metal barrels or drums.

(2) Specifications 17H or 37A (§§ 178.118, 178.131 of this subchapter) metal drums. A specification 37A metal drum constructed from 22-gauge steel throughout is authorized for a gross weight of 490 pounds or less when it is shipped in a carload or truckload lot.

(3) Specification 15A, 15B, or 19B (§§ 178.168, 178.169, 178.191 of this subchapter). Wooden boxes, with inside glass bottles of not over 5 pounds capacity each, with closures securely fastened, each bottle individually packed in a tight metal container, and cushioned therein with incombustible mineral packing material; or with inside tightly closed metal containers, not over 10 pounds capacity each.

(4) Spec. 12A (§ 178.210 of this subchapter). Fiberboard boxes with inside glass bottles not over 5 pounds capacity each. Not more than four bottles having capacity of 5 pounds each, shall be packed in one outside container. Shipper must have established that completed package meets test requirements prescribed by § 178.210-10 of this subchapter.

(5) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes with metal inside containers which must have closing device securely fastened by positive means (not friction), not over 1-gallon capacity each. Not more than 4 metal containers shall be packed in one outside box.

(6) Specification 21C (§ 178.224 of this subchapter). Fiber drums lined with a plastic material having a minimum thickness of 0.003-inch. Net weight may not exceed 115 pounds.

(7) Specification 56 (§ 178.252 of this subchapter). Steel portable tank.

[29 FR 18709, Dec. 29, 1964, as amended by Order 71, 31 FR 9070, July 1, 1966. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16070, Apr. 15, 1976; Amdt. 173-14, 45 FR 59889, Sept. 11, 1980; Amdt. 173-149, 46 FR 49896, Oct. 8, 1981; Amdt. 173-151, 46 FR 58695, Dec. 3, 1981; Amdt. 173-187, 50 FR 11703, Mar. 25, 1985]

§ 173.165 Coal, ground bituminous, sea coal, coal facings.

(a) Coal, ground bituminous, sea coal, coal facings, 90 percent of which will pass through a 100-mesh sieve, must be stored for at least six days after grinding, or if not so stored must be shipped in tight metal tank cars or in tight metal containers on container cars, or in permanently covered metal hopper cars, or in other tight metal containers, or in tight, metal-bodied, covered motor vehicles.

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[1] Use of existing tank cars authorized, but new construction not authorized.

(b) Coal, ground bituminous, which has been dried by heating before grinding must be packed in hermetically sealed metal-lined wooden boxes or air-tight metal containers.

§ 173.166 Cobalt resinate, precipitated, calcium resinate, and calcium resinate fused.

(a) Cobalt resinate, precipitated, calcium resinate, and calcium resinate fused, must be packed in specification containers as follows:

(1) Specification 6B, or 6C (§ 178.98 or § 178.99 of this subchapter). Metal barrels or drums.

(2) Spec. 17E, 17H, 37A, or 37B (§§ 178.116, 178.118, 178.131, or § 178.132 of this subchapter). Metal drums (single-trip).

(3) Spec. 15A or 15B (§ 178.168 or § 178.169 of this subchapter). Wooden boxes with air-tight metal inside containers.

[29 FR 18709, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.166, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.168 Lithium amide, powdered.

(a) Lithium amide, powdered, must be packed as follows:

(1) As prescribed in § 173.154(a) (1), (2), (8) and (11).

(2) Spec. 21C (§ 178.224 of this subchapter). Fiber drums with inside metal drums, Spec. 2F (§ 178.25 of this subchapter). Authorized net weight not over 225 pounds.

[29 FR 18709, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16070, Apr. 15, 1976; Amdt. 173-121, 43 FR 48644, Oct. 19, 1978]

§ 173.171 Fish scrap or fish meal.

Fish scrap or fish meal containing less than 6 or more than 12 percent moisture (does not include wet acidulated fish scrap with moisture 40 to 55 percent), or which has not been sufficiently cooled after manufacture, or is liable to spontaneous heating in transit, must be packed in air-tight metal containers.

[29 FR 18709, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16070, Apr. 15, 1976]

§ 173.173 Aluminum dross or magnesium dross.

Aluminum dross or magnesium dross must not be shipped when hot or when containing moisture liable to cause heating or fire during transportation.

§ 173.174 Iron sponge, spent oxide, spent iron mass, spent iron sponge.

(a) Iron sponge that has not been properly oxidized during manufacture must be packed in hermetically sealed metal-lined wooden boxes or air-tight metal containers.

(b) [Reserved]

(c) Spent oxide, spent iron mass, or spent iron sponge must be loaded in open steel cars or open highway vehicles with steel bodies. After exposure to air for a period of not less than 10 days, these articles may be offered for transportation by carrier by water in bulk in all-steel barges having open holds.

[29 FR 18709, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16070, Apr. 15, 1976]

§ 173.175 Lacquer base, or lacquer chips, dry.

(a) Lacquer base, or lacquer chips, dry, must be packed in specification containers as follows:

(1) Specification 15A, 15B, 15C, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside metal containers, Spec. 2F (§ 178.25 of this subchapter).

(2) Specification 6B or 6C (§ 178.98 or § 178.99 of this subchapter). Metal barrels or drums.

(3) Spec. 17E, 17H, 37A, 37B, or 37C (§§ 178.116, 178.118, 178.131, 178.132, or § 178.135 of this subchapter). Metal drums (single-trip), or Spec. 37C (nonreusable container).

(4) Spec. 21C (§ 178.224 of this subchapter). Fiber drums. Authorized net weight not over 225 pounds.

[29 FR 18709, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16070, Apr. 15, 1976;

Amdt. 173-14, 45 FR 59889, Sept. 11, 1980; Amdt. 173-149, 46 FR 49896, Oct. 8, 1981]

§ 173.176 Safety matches.

(a) Safety matches (strike-on-box, book, and card) are matches which are intended to be ignited on a prepared surface. Safety matches, when offered for transportation, must be of a type which will not ignite spontaneously or undergo marked decomposition when subjected for eight consecutive hours to a temperature of 200 °F. (93.3 °C.). As used in this section, the term "safety matches" includes matches combined with or attached to the box, book, or card.

(b) Safety matches must be tightly packed in securely closed inside packagings to prevent accidental ignition under conditions normally incident to transportation, and further packed in outside fiberboard, wooden, or other equivalent-type packagings. Safety matches in outside packagings not exceeding 50 pounds gross weight are not subject to any other requirement (except marking) of this subchapter. Safety matches may be packed in the same outside packaging with materials not subject to this subchapter.

(49 U.S.C. 1803, 1804, 1808, 49 CFR 1.53, App. A to Part 1)

[Amdt. 173-177, 49 FR 35951, Sept. 13, 1984]

§ 173.176a Strike anywhere matches.

(a) Strike anywhere matches are matches which may be ignited by friction on a solid surface. Strike anywhere matches, when offered for transportation, must be of a type which will not ignite spontaneously or under go marked decomposition when one complete inside package is subjected for eight consecutive hours to a temperature of 200 °F. (93.3 °C.).

(b) Strike anywhere matches may not be packed in the same outside packaging with any material other than safety matches. The safety matches must be packed in separate inside packagings.

(c) *Inside packagings.* Strike anywhere matches must be tightly packed in securely closed chipboard, fiberboard, wooden, or metal inside packagings to prevent accidental ignition under conditions normally incident to transportation. Each inside packaging may contain no more than 700 strike anywhere matches.

(d) *Outside packagings.* Strike anywhere matches must be packed in specification packagings as follows:

(1) Spec. 15A or 19B (§§ 178.191 of this subchapter). Wooden boxes, with inside packages. Gross weight must not exceed 100 pounds.

(2) Spec. 12B or 12C (§§ 178.205, 178.206 of this subchapter). Fiberboard boxes, with inside packages. Gross weight must not exceed 60 pounds. Fill-in pieces specified by § 178.205-14 or § 178.206-14 of this subchapter are not required.

(49 U.S.C. 1803, 1804, 1808, 49 CFR 1.53, App. A to Part 1)

[Amdt. 173-177, 49 FR 35951, Sept. 13, 1984]

§ 173.177 Motion-picture film and X-ray film.

(a) Motion-picture film and X-ray film (nitrocellulose base) must be packed in specification containers as follows:

(1) Spec. 32A or 32B (§ 178.146 or § 178.147 of this subchapter). Metal cases.

(2) Specification 15A, 15B, 15C, or 19B (§§ 178.168, 178.169, 178.170, 178.191 of this subchapter). Wooden boxes with each reel in a tightly closed metal can, or strong cardboard of fiberboard box with cover held in place by adhesive tape or paper. Gross weight must not exceed 200 pounds.

(3) Spec. 12E (§ 178.205 of this subchapter). Fiberboard boxes complying with § 178.205-22(a)(1) of this subchapter; authorized for a single tightly closed inside metal can or strong cardboard or fiberboard box with cover held in place by adhesive tape or paper, not over 2,000 feet of film. Taped closure authorized.

(4) Spec. 12B (§ 178.205 of this subchapter). One-piece fiberboard boxes complying with § 178.205-22(a)(2) of this subchapter; authorized only when each film is in a tightly closed metal filmreel can or strong cardboard or fiberboard box with cover held in place by adhesive tape or paper containing not over 2,000 feet (approximately) of film; cans or boxes to be adequately braced in center of box by fiberboard, at least 175-pound test, extending full

depth of box. Gross weight not over 65 pounds. Closing of box must be effected by coating entire contact surfaces of flaps with efficient adhesive; stitched closure not authorized. Boxes that have been filled, shipped, and opened, are not authorized for reuse.

(5) Spec. 32C (§ 178.148 of this subchapter). Trunks with each film in standard metal film-reel can or strong cardboard or fiberboard box with cover held in place by adhesive tape or paper. Trunks to contain no material other than films in cans or boxes and projecting apparatus. The apparatus, as packed, must not be capable of creating an electric current.

(6) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes complying with § 178.205-27 of this subchapter; authorized only for not more than two square inside metal cans containing not over 200 feet (approx.) of film each; gross weight not over 15 pounds. Taped closure authorized.

(b) Slow burning motion-picture film is excepted from the requirements of this subchapter, except when packed with flammable film.

[29 FR 18709, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16070, Apr. 15, 1976; Amdt. 173-149, 46 FR 49896, Oct. 8, 1981]

§ 173.178 Calcium carbide, calcium silicon powder, and magnesium granules, coated.

(a) Calcium carbide, calcium silicon powder, and magnesium granules, coated must be packed as follows:

(1) In water-tight metal drums with rolled, folded top and bottom seams and with welded side seams. Closures must be of the friction-type or screw-type. Full open-top closures must be gasketed and equipped with leverlock or bolted clamping ring. Maximum rated capacity may not exceed 60 gallons.

(2) In water-tight, sift-proof, bulk metal containers.

(3) In water-tight, sift-proof, closed-top metal covered hopper rail cars.

(4) In water-tight, sift-proof, closed-top metal covered hopper motor vehicles.

(5) In water-tight metal containers not exceeding 10 pounds net weight.

[Amdt. 173-94, 41 FR 16071, Apr. 15, 1976, as amended by Amdt. 173-133, 44 FR 60100, Oct. 18, 1979; Amdt. 173-141, 45 FR 62081, Sept. 18, 1980; Amdt. 173-151, 46 FR 58695, Dec. 3, 1981]

§ 173.179 N-methyl-N'-nitro-N-nitrosoguanidine.

N-methyl-N'nitro-N-nitrosoguanidine must be packaged as follows: The quantity in one outside packaging may not exceed 25 grams and must be placed in a polyethylene bottle which is tightly closed and the closure secured in place with pressure sensitive tape. The bottle must be sealed in a polyethylene bag constructed of polyethylene at least 4 mils thick. The bag containing the bottle must be cushioned in a hermetically sealed can with noncombustible cushioning material. There must be at least one inch of cushioning material between the outer surface of the bag and the inner surface of the can. The metal can must be cushioned in a DOT 12B fiberboard box constructed of at least 350 pound test fiberboard. There must be at least one inch of cushioning material between the outer surface of the can and the inner surface of the fiberboard box.

[Amdt. 173-137, 45 FR 34703, May 22, 1980]

§ 173.182 Nitrates.

(a) Aluminum nitrate, ammonium nitrate (no organic coating), ammonium nitrate (organic coating), ammonium nitrate-carbonate mixture, ammonium nitrate-phosphate, ammonium nitrate fertilizer,[1] (containing no more than 0.2 percent carbon), ammonium nitrate mixed fertilizer, barium nitrate, beryllium nitrate, calcium nitrate, cupric nitrate, ferric nitrate (NOTE: The double salt of calcium and ammonium nitrate ($5Ca(NO_3)_2NH_4NO_3$ $10H_2O$) containing not more than 15.5 percent nitrogen and at least 12 percent water is not subject to the regulations in this subchapter), guanidine nitrate, lead nitrate, magnesium nitrate, mercuric nitrate, nickel nitrate, nitrates, n.o.s., nitrate of soda and potash, potassium nitrate, silver nitrate, sodium nitrate, strontium nitrate, zinc nitrate and zirconium nitrate must be packaged as follows:

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[1] Applies only to materials tested in accordance with and meeting the definition in The Fertilizer Institute's publication "Definition and Test Procedures for Ammonium Nitrate Fertilizer" dated May 7, 1971.

(1) In wooden or fiberboard boxes with glass, metal, or other strong inside containers; in metal or fiber drums; in kegs or barrels; or in strong metal cans. When so packed, they are excepted from the specification packaging requirements of this part.

(b) Aluminum nitrate, ammonium nitrate (no organic coating), ammonium nitrate-carbonate mixture, ammonium nitrate-phosphate, ammonium nitrate fertilizer[1] (containing no more than 0.2 percent carbon) ammonium nitrate mixed fertilizer, barium nitrate, beryllium nitrate, calcium nitrate, cupric nitrate, ferric nitrate, guanidine nitrate, mercuric nitrate, nickel nitrate, nitrate of soda and potash, potassium nitrate, sodium nitrate, strontium nitrate, and zirconium nitrate, in addition to containers prescribed in paragraph (a) of this section, may be packaged as follows:

(1) In bulk, in tightly closed freight cars.

(2) In bulk, in sift-proof closed or open type motor vehicles.

(3) [Reserved]

(4) In burlap bags not exceeding 200 pounds net weight, water-resistant, made tight against sifting, and made of not less than 7½-ounce burlap.

(5) Multiple-wall paper bags must be constructed as follows:

(i) At least 4-ply including moisture-barrier ply, and made tight against sifting. Maximum authorized net weight is 110 pounds. Completed package, filled to weight with product and closed for shipment, must be capable of withstanding three 4-foot drops on face or back onto solid concrete without rupture.

(ii) At least 3-plies of extensible kraft paper having a minimum total basis weight of 180 pounds including an innermost ply coated with polyethylene to provide a moisture barrier. Maximum authorized net weight is 80 pounds. Completed package, filled to weight with product and closed for shipment, must be capable of withstanding three 4-foot drops on face or back onto solid concrete without rupture.

(6) Plastic bags must be constructed as follows:

(i) Specification 44P (§ 178.241 of this subchapter). All plastic bags. Maximum authorized net weight is 81 pounds. Authorized only for ammonium nitrate mixed fertilizer, ammonium nitrate fertilizer (containing no more than 0.2 percent carbon), and potassium nitrate.

(ii) Polypropylene bag made of 9 denier polypropylene fibers spun continuously to form a sheet weighing at least 3½ ounces per square yard. Maximum authorized net weight is 100 pounds. Each bag must have an inner liner of polyethylene not less than 4 mils thick. Each bag filled to weight with product and closed for shipment must be capable of withstanding three 4-foot drops on face or back onto solid concrete without rupture. Authorized only for amonium nitrate (no organic coating), ammonium nitrate fertilizer, and potassium nitrate; or

(iii) Polyethylene bag made of two plies of high-density polyethylene film laminated together so that the orientation of each ply of film is at right angles to the other. Maximum authorized net weight is 100 pounds. For a net weight not exceeding 50 pounds, the thickness of each bag must be at least 2.5 mils. For a net weight exceeding 50 pounds but not exceeding 100 pounds, the thickness of each bag must be at least 4 mils. Each bag must be capable of withstanding the test requirements of § 178.241-4 and each bag must be in compliance with the requirements of § 178.241-3 of this subchapter for bag closures. Authorized only for ammonium nitrate (no organic coating), ammonium nitrate fertilizer, and sodium nitrate.

(7) Specification 53[2] or 56 (§§ 178.251, 178.252 of this subchapter). Portable tank. Authorized only for sodium nitrate.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 173-94, 41 FR 16071, Apr. 15, 1976]

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[2] Use of existing tanks authorized. Construction not authorized after May 31, 1972.

Editorial Note: For Federal Register citations affecting § 173.182, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.183 Potassium nitrate mixed (fused) with sodium nitrite.

(a) Potassium nitrate mixed (fused) with sodium nitrite must be packed in containers as follows:

(1) In containers as prescribed in § 173.182(a).

(2) Spec. 103-W (§§ 179.200 and 179.201 of this subchapter). Tank cars specially designed, equipped and approved for this service without bottom discharge outlet and with heavier plate thicknesses than the minimum prescribed for cars built under this specification. For specification 103-W tank cars made of plates having the minimum prescribed thicknesses, internal reinforcement of the upper sheets of tank in the region of the dome and reinforcing plates attached to the bottom sheet of the tank which rests on bolsters is required, and these tanks must be equipped with baffle plates. Heater pipes must be of welded construction designed for a test pressure of 500 pounds per square inch. A 1-inch woven asbestos lining must be placed between bolster slabbing and bottom of tank to prevent heat transmission. Safety vents of the frangible disc type may be used and if used the frangible discs must be perforated with ⅛ inch hole. If safety valves are used, a vacuum relief valve must be installed on the dome. Each tank car must be marked "Fused Potassium Nitrate and Sodium Nitrite" in accordance with the requirements of § 172.330 of this subchapter.

[29 FR 18709, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

Editorial Note: For Federal Register citations affecting § 173.183, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.184 Nitrocellulose or collodion cotton, wet, or nitrocellulose, colloided, granular, or flake, wet, or nitrostarch, wet, or nitroguanidine, wet.

(a) Nitrocellulose or collodion cotton, wet, or nitrocellulose, colloided, granular, or flake, wet, or nitrostarch, wet, or nitroguanidine, wet, must be uniformly wet with at least 20 pounds of water to 80 pounds of dry material and must be packed in specification containers as follows:

(1) [Reserved]

(2) Specification 14, 15A, 15B, or 19B (§§ 178.165, 178.168, 178.169, 178.191 of this subchapter). Wooden boxes lined, Spec. 2M (§ 178.31 of this subchapter).

(3) Specification 6B, 6C, or 6J (§§ 178.98, 178.99, 178.100 of this subchapter). Metal barrels or drums not over 55 gallons capacity. Specification 6J (§ 178.100 of this subchapter) drums must have removable heads of 14 gauge metal or 16 gauge metal with one or more corrugations near the periphery and the heads must have a minimum convexity of ⅜ inch; each drum must have three rolled or swedged-in hoops, one of which shall be in the body near the top curl.

(4) Spec. 37A or 37B (§ 178.131 or § 178.132 of this subchapter). Metal drums (single-trip) not over 5 gallons capacity. Welded side seams required.

(5) Spec. 17E or 17H (§ 178.116 or § 178.118 of this subchapter). Metal drums (single-trip).

(6) [Reserved]

(b) Gross weight of any container must not exceed 490 pounds.

[29 FR 18709, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-81, 39 FR 17317, May 15, 1974; Amdt. 173-94, 41 FR 16071, Apr. 15, 1976; Amdt. 173-14, 45 FR 59889, Sept. 11, 1980; Amdt. 173-149, 46 FR 49896, Oct. 8, 1981]

§ 173.187 Potassium peroxide; potassium superoxide; sodium peroxide or sodium superoxide.

(a) Potassium peroxide, potassium superoxide, sodium peroxide or sodium superoxide must be packed in specification containers as follows:

(1) Specification 15A, 15B, 15C, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside air-tight metal cans.

(2) Specification 6B or 6C (§§ 178.98, 178.99 of this subchapter). Metal barrels or drums.

(3) Spec. 17E, 17H, 37A, or 37B (§§ 178.116, 178.118, 178.131, or § 178.132 of this subchapter). Metal drums (single-trip).

(4) Spec. 12A or 12B (§ 178.210 or § 178.205 of this subchapter). Fiberboard boxes with inside air-tight metal cans not over 5 pounds capacity each.

[29 FR 18709, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-81, 39 FR 17317, May 15, 1974; Amdt. 173-94, 41 FR 16071, Apr. 15, 1976; Amdt. 173-14, 45 FR 59889, Sept. 11, 1980; Amdt. 173-149, 46 FR 49896, Oct. 8, 1981]

§ 173.188 Phosphoric anhydride.

(a) Phosphoric anhydride must be packed in specification containers as follows:

(1) Specification 15A, 15B, 15C, or 19B (§§ 178.168, 178.169, 178.170, 178.191 of this subchapter). Wooden boxes with inside tightly stoppered glass bottles not over 1-pound capacity each; or metal cans, not over 3 pounds capacity each, hermetically sealed (soldered) or closed with cork securely held in place by metal strap soldered in position. Inside containers must be cushioned with elastic incombustible packing materials.

(2) Specification 6B or 6C (§§ 178.98, 178.99 of this subchapter). Metal barrels or drums.

(3) Spec. 17E, 17H, 37A, or 37B (§§ 178.116, 178.118, 178.131, or § 178.132 of this subchapter). Metal drums (single-trip).

(4) Specification 56 (§ 178.252 of this subchapter). Stainless steel portable tanks.

(5) Spec. 12A (§ 178.210 of this subchapter). Fiberboard boxes with inside glass bottles not over 1 pound capacity each. Not more than 12 bottles shall be packed in one outside box. Shipper must have established that completed package meets test requirements prescribed by § 178.210-10 of this subchapter.

(6) Spec. 12A (§ 178.210 of this subchapter). Fiberboard boxes with inside glass bottles of one-third fluid ounce capacity each. Each bottle shall be packed in a heat-sealed polyethylene or other suitable plastic bag of equal efficiency and not more than 75 such units shall be packed in a heat-sealed polyethylene or other suitable plastic bag of equal efficiency, which shall be placed in a securely closed metal can. Not more than 1 can shall be packed in one outside box.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[29 FR 18709, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.188, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.189 Phosphorus, amorphous, red.

(a) Phosphorus, amorphous, red, must be packed in specification containers as follows:

(1) Specification 15A, 15B, or 19B (§§ 178.168, 178.169, 178.191 of this subchapter). Wooden boxes with inside air-tight metal containers.

(2) Specification 6B; also 37A or 37B (single-trip containers) (§§ 178.98, 178.131, 178.130 of this subchapter). Metal barrels or drums. Gross weight not to exceed 160 pounds.

(3) Spec. 29 (§ 178.226 of this subchapter). Mailing tube having not more than 100 grams of phosphorous contained in an inside glass container, sealed under nitrogen or other inert gas, with an air tight closure. The glass container shall be packed in a metal can having air tight closure. Both the inside glass container and the metal can shall be surrounded on all sides with incombustible cushioning material.

[29 FR 18709, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16071, Apr. 15, 1976; Amdt. 173-14, 45 FR 59889, Sept. 11, 1980; Amdt. 173-149, 46 FR 49896, Oct. 8, 1981]

§ 173.190 Phosphorus, white or yellow.

(a) Phosphorus, white or yellow, when offered for transportation by rail freight, highway, or water, must be packed in water or dry.

(b) When placed in water it must be packed in specification containers as follows:

(1) Specification 15A, 15B, or 19B (§§ 178.168, 178.169, 178.191 of this subchapter). Wooden boxes with inside hermetically sealed (soldered) metal cans, inclosed in other hermetically sealed (soldered) metal cans, or inside water-tight metal cans containing not over 1-pound with screw-top closures, or Spec. 2F (§ 178.25 of this subchapter).

(2) Specification 5A or 6B (§§ 178.81, 178.98 of this subchapter). Metal barrels or drums, not over 30 gallons capacity each.

(3) Spec. 103,[1] 103-W, 111A60-F-1 or 111A60-W-1 (§§ 179.200, 179.201 of this subchapter). Tank cars without bottom outlet for discharge of lading and with approved dome fittings, external heater systems, and with insulation at least 4 inches in thickness, except that thickness of insulation may be reduced to 2 inches over external heater coils. Bottom washout nozzle of approved design may be applied. The material must be immersed in water or be blanketed with an inert gas and be loaded at a temperature not exceeding 140° F. The water must be loaded in the dome to not more than 50 percent of the capacity of the dome. After unloading, the tank must be filled to its entire capacity with an inert gas or to its entire capacity and dome to not more than 50 percent of its capacity with water having a temperature not exceeding 140° F. and placarded with "EMPTY—FLAMMABLE SOLID" placards as described in § 172.525 of this subchapter before the car is offered for return movement.

(i) Each tank car must be marked "PHOSPHORUS" in accordance with the requirements of § 172.330 of this subchapter.

NOTE 1: Until further order of the Department, Specification ARA-III[1] tank cars, converted as follows, are authorized for use: Without bottom discharge outlet, with insulation at least 2 inches in thickness, internal heater coils, at least one safety valve or frangible disc safety vent of approved design, and dome equipped for top unloading. Cars to be loaded and unloaded as prescribed in paragraph (b)(3) of this section. Cars to be stenciled immediately above the mark ARA-III[1] with the words "FOR PHOSPHORUS ONLY".

(4) Specification MC 310, MC 311, or MC 312 (§ 178.343 of this subchapter). Tank motor vehicles, without bottom outlet and with insulation at least 4 inches in thickness, except that 2 inches of insulation is authorized for tanks equipped with an exterior heating jacket. Interior heating coils are not authorized. The material must be immersed in water or be blanketed with an inert gas and be loaded at a temperature not exceeding 140° F. After unloading, the tank must be filled to its entire capacity with an inert gas or to its entire capacity with water having a temperature not exceeding 140° F.

(5) Specification IM 101 portable tanks (§§ 178.270, and 178.271 of this subchapter) are authorized under the conditions specifed in the IM Tank Table. The material must be immersed in water or blanketed with an enert gas and be loaded at a temperature not exceeding 140°F. After unloading, the tank must be filled with an inert gas or water having a temperature not exceeding 140°F.

(c) Phosphorus, white or yellow, when offered for transportation by air must be packed in water in packaging as follows (also authorized for transportation by rail freight, highway or water):

(1) Specification 15A, 15B, 19A or 19B (§§ 178.168, 178.169, 178.190, 178.191 of this subchapter). Wooden boxes with inside hermetically sealed (soldered) metal cars, inclosed in other water-tight metal cans containing not over 1-pound with screw-top closures, or with soldered closures.

(2) Samples of phosphorus, white or yellow, not to exceed 4 ounces each, placed in water in sealed metal cylinders or cans, inclosed in a wooden box, Spec. 15A or 15B (§ 178.168 or § 178.169 of this subchapter), may be transported only when consigned to the laboratory of the Internal Revenue Bureau or to the Hygienic Laboratory of the Public Health Service, Washington, D.C.

(3) Spec. 29 (§ 178.226 of this subchapter). Mailing tube having a water-tight rigid polyethylene container in which is placed a quartz tube containing not more than 100 grams of phosphorus sealed under nitrogen or other inert gas, with the remaining space in the polyethylene container filled with water. The polyethylene container shall be cushioned within the mailing tube with incombustible cushioning material.

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[1] Use of existing tank cars authorized, but new construction not authorized.

(d) Phosphorus, white or yellow, when dry must be cast solid and shipped in containers as follows:

(1) Specification 6B, or 6C (§§ 178.98, 178.99 of this subchapter). Metal barrels or drums not over 30 gallons capacity each.

(2) In projectiles or bombs when shipped by, for, or to the Departments of the Army, Navy, and the Air Force of the United States Government, without bursting elements.

[29 FR 18709, Dec. 29, 1964, as amended by Order 73, 32 FR 3455, Mar. 2, 1967. Redesignated at 32 FR 5606, Apr. 5, 1967]

Editorial Note: For Federal Register citations affecting § 173.190, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

Effective Date Note: Section 173.190 was amended at 50 FR 39008, Sept. 26, 1985, by revising the last sentence of paragraph (b)(3), effective October 1, 1986. The text of paragraph (b)(3) effective October 1, 1986, is set forth below.

§ 173.190 Phosphorus, white or yellow.

* * * * *

(b) * * *

(3) * * * After unloading, the person who unloaded the tank car must fill it to its entire capacity with an inert gas or must fill it with water having a temperature not exceeding 140°F, to not more than 50 percent of the capacity of its dome. Before the car is offered for return movement, it must be placarded with FLAMMABLE SOLID-RESIDUE placards, as described in § 172.525 of this subchapter.

* * * * *

§ 173.191 Phosphorus pentachloride.

(a) Phosphorus pentachloride must be packed in specification containers as follows:

(1) Specification 15A, 15B, 15C, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside glass or glazed earthenware containers, not over 25 pounds capacity each, cushioned with mineral packing. When inside containers are packed in the same outside container with other articles, they must be enclosed in tightly closed metal cans. Net weight not to exceed 50 pounds in each outside box.

(2) Specification 6B, or 6C; also 37A or 37B (single-trip containers) (§§ 178.98, 178.99, 178.131, or § 178.132 of this subchapter). "Black iron" metal barrels or drums.

[29 FR 18709, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

Editorial Note: For Federal Register citations affecting § 173.191, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.192 Ammonium picrate, picric acid, trinitrobenzoic acid, and urea nitrate, wet.

Ammonium picrate, picric acid, trinitrobenzoic acid, and urea nitrate, wet with not less than 10 percent water, in quantity not exceeding 16 ounces in one outside package, may be shipped as drugs, medicines, or chemicals, when in glass bottles securely stoppered, each bottle inclosed in a strong fiber carton properly cushioned in the outside shipping case. No restrictions other than packing prescribed by this section are required when these materials are offered for transportation.

[Amdt. 173-121, 43 FR 48644, Oct. 19, 1978]

§ 173.193 Picric acid, trinitrobenzoic acid, or urea nitrate, wet.

(a) Picric acid, trinitrobenzoic acid, or urea nitrate, wet with not less than 10 percent water must be packed in specification containers as follows:

(1) Specification 15A or 19B (§§ 178.168, 178.191 of this subchapter). Wooden boxes with inside glass or earthenware containers, cushioned and tightly closed. The net weight in an outside package must not exceed 25 pounds dry weight. (See § 173.65 for shipment of wet picric acid, wet trinitrobenzoic acid and wet urea nitrate in excess of 25 pounds, and § 173.192 for exemption up to 16 ounces.)

(2) Specification 21C (§ 178.224 of this subchapter). Fiber drums of not over 6½ gallons capacity with one inside 5-mil polyethylene bag. Drum must be made vapor tight through the installation of a 7-mil polyethylene interior lining, plus 1½ mil of polyethylene buried in the inside ply of the drum. The full open head of the container must be made vapor tight by the use of a 24-gauge metal lid with a

10-mil preformed sealing disc glued to the rubber gasket cover and locked with a lever type locking ring and a pilfer proof seal. The net weight of the dry material shall not exceed 25 pounds.

[29 FR 18709, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16072, Apr. 15, 1976; Amdt. 173-116, 43 FR 17944, Apr. 27, 1978; Amdt. 173-149, 46 FR 49897, Oct 8, 1981; Amdt. 173-192, 50 FR 41522, Oct. 11, 1985]

§ 173.194 Potassium permanganate.

(a) Potassium permanganate must be packed in specification containers as follows:

(1) In containers as prescribed in § 173.154.

(2) In bulk, in sift-proof, self-clearing, covered hopper or bottom outlet steel cars or in sift-proof all steel flat bottom gondola cars with fixed sides and ends equipped with water-proof and dust-proof wooden or steel covers well secured in place for all openings, or in bulk, in motor vehicles with steel, sift-proof, self-clearing hopper-type or dump-type bodies, with water-proof and dust-proof covers, well secured in place. Such cars, when used exclusively in this service and stenciled "FOR POTASSIUM PERMANGANATE ONLY," are not subject to the requirements of § 174.515 of this subchapter.

[29 FR 18709, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16072, Apr. 15, 1976]

§ 173.195 Pyroxylin plastic scrap.

(a) Pyroxylin plastic scrap must be packaged as follows:

(1) Specification 15A, 15B, or 19B (§§ 178.168, 178.169, 178.191 of this subchapter). Wooden boxes lined, Spec. 2F or 2M (§§ 178.25, 178.31 of this subchapter). Gross weight must not exceed 450 pounds each.

(2) Specification 6B, 6C, or 6J; also 17H, 37A, or 37B (single-trip containers) (§§ 178.98, 178.99, 178.100, 178.118, 178.131, or § 178.132 of this subchapter). Metal barrels or drums.

(3)–(4) [Reserved]

(5) Spec. 21C (§ 178.224 of this subchapter). Fiber drums. Must be externally treated to provide protection against moisture. Authorized net weight not over 225 pounds.

(b) Pyroxylin plastic scrap, photographic film scrap, X-ray film scrap, motion picture film scrap, or pieces of exposed or unexposed film which show evidence of decomposition or instability or are liable to decompose or become unstable must be packed submerged in water in specification containers as follows:

(1) Specification 6B or 6C; or 17H (single-trip) (§§ 178.98, § 178.99, or § 178.118 of this subchapter). Metal barrels or drums.

(2) Specification 15A, 15B, 15C, or 19B (§§ 178.168, 178.169, 178.170, 178.191 of this subchapter). Wooden boxes with tightly closed inside metal containers.

[29 FR 18709, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-81, 39 FR 17317, May 15, 1974; Amdt. 173-94, 41 FR 16072, Apr. 15, 1976; Amdt. 173-14, 45 FR 59890, Sept. 11, 1980; Amdt. 173-149, 46 FR 49897, Oct. 8, 1981]

§ 173.197 Pyroxylin plastics, in sheets, rolls, rods, or tubes.

(a) Pyroxylin plastics, in sheets, rolls, rods, or tubes containing nitrocellulose are subject to this subchapter only when offered for transportation by air or water and then must be packaged as follows:

(1) Specification 15A, 15B, 19A, or 19B (§§ 178.168, 178.169, 178.190, 178.191 of this subchapter). Wooden boxes.

(2) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes. Special boxes §§ 178.205-20 and 178.205-21 authorized only for pyroxylin in sheets, rods or tubes.

(3) Sheets rolled, in spec. 21C (§ 178.224 of this subchapter) fiber drums, having 2 straps applied lengthwise and one or more circumferentially; straps at least ½ by 0.02 inch steel. Authorized net weight not over 225 pounds.

(4) Sheets, rolled, not over 15 pounds net weight in fiber tubes lined throughout with singlefaced corrugated fiberboard at least 0.2 inch thick and securely closed; tube material at least 0.115 inch thick for side walls and 0.05 inch thick for ends with strength, Mullen or Cady test, at least

245 and 220 pounds respectively; metal ends for tubes acceptable when lined with fiber discs at least 0.05 inch thick.

(b) Pyroxylin plastics in manufactured articles or articles made therefrom is not subject to Parts 170–189 of this subchapter and Part 397 of this title.

[29 FR 18709, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16072, Apr. 15, 1976; Amdt. 173-149, 46 FR 49897, Oct. 8, 1981]

§ 173.197a Smokeless powder for small arms.

Smokeless powder for small arms in quantities not exceeding 100 pounds net weight transported in one car or motor vehicle may be classed as a flammable solid when examined for this classification by the Bureau of Explosives and approved by the Director, OHMT. Maximum quantity in any inside packaging must not exceed 8 pounds and inside packagings must be arranged and protected to prevent simultaneous ignition of the contents. The complete package must be a type examined by the Bureau of Explosives and approved by the Director, OHMT. Each outside package must bear a flammable solid label.

[Amdt. 173-138, 45 FR 32696, May 19, 1980]

§ 173.198 Sodium hydride.

(a) Sodium hydride must be packed in specification containers as follows:

(1) In containers as prescribed in § 173.206 (a)(1) and (a)(2).

(2) Spec. 17H (§ 178.118 of this subchapter). Metal drums (single-trip).

(3) Spec. 37A or 37B (§ 178.131 or § 178.132 of this subchapter). Metal drums (single-trip) with welded side seams and hermetically sealed closure or closure made fast by positive pressure of the lid against a rubber gasket with edge of the lid crimped over the lip of the drum and a protective metal ring fastened around the crimped edge, packed in strong outside wooden boxes.

[29 FR 18709, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16072, Apr. 15, 1976]

§ 173.202 Sodium metal liquid alloy, potassium metal liquid alloy, and sodium potassium liquid alloy.

(a) Sodium metal liquid alloy, potassium metal liquid alloy, and sodium potassium liquid alloy, must be packed in specification containers as follows:

(1) Specification 15A, 15B, or 19B (§§ 178.168, 178.169, 178.191 of this subchapter) wooden boxes with inside metal packagings. Inside packagings must be cushioned with incombustible cushioning material. Each inside metal packaging must have been tested hydrostatically to a pressure of not less than 60 pounds per square inch without rupture. Closing devices on inside metal packagings must be protected from injury. Not more than 300 pounds of the material may be shipped in one outside box.

(2) Spec. 5A (§ 178.81 of this subchapter), metal barrels or drums not exceeding 400 pounds capacity each, having protruding valves protected by a 12-gauge steel dome securely attached to the head of the drum. Shipments are authorized by rail freight in carload lots only and by motor vehicle in truckload lots only.

(3) Specification 4BW240 (§ 178.61 of this subchapter) cylinder. Each cylinder must be equipped with steel valve protection caps or collars, or be packed in strong wooden boxes and secured therein to protect the valves.

(4) Specification 51 (§ 178.245 of this subchapter) portable tank. Tanks shall have a minimum design pressure of 150 pounds per square inch. Safety relief devices must communicate with the vapor space when tanks are fully loaded. Tank must be blanketed with dry nitrogen at a pressure not to exceed 15 psig at all times.

(b) Packaging of metallic liquid alloys of sodium or potassium in combination with fissile or large quantities of radioactive material, is authorized as provided in § 173.206(a)(10) and (12).

[29 FR 18700, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.202, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.203 Tetranitromethane.

(a) Tetranitromethane must be packed in specification containers as follows:

(1) Specification 15A, 15B, or 19B (§§ 178.168, 178.169, 178.191 of this subchapter). Wooden boxes, gross weight not exceeding 150 pounds, with inside containers which must be: glass bottles not more than 1 quart capacity each, with closures securely fastened and of a type not deteriorated by the contents, each bottle individually packed in a tight metal container and cushioned therein with absorbent incombustible material; or aluminum cans or polyethylene bottles, not more than 5 pounds capacity each, with opening not more than 1.25 inches diameter, fitted with securely fastened screw type closures and gaskets of material not deteriorated by contact with the contents, cushioned with not less than 2 inches of absorbent incombustible cushioning material between the inside containers and any part of the wooden box.

(2) Specification 6B or 6C (§§ 178.98, 178.99 of this subchapter). Metal barrels or drums, with an inside stainless steel or aluminum drum(s). The inside drum may have no opening larger than 2.5 inches in diameter and must be securely closed by a gasketed screw type device. Gaskets must be made of materials that will not deteriorate upon contact with the contents. The inside drum(s) must be cushioned with not less than 2 inches of absorbent incombustible cushioning material. Each inside drum shall be of not less than 20 gauge metal and shall be tested for leakage before packing in the outside drum.

[29 FR 18709, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16072, Apr. 15, 1976; Amdt. 173-14, 45 FR 59890, Sept. 11, 1980; Amdt. 173-149, 46 FR 49897, Oct. 8, 1981]

§ 173.204 Sodium hydrosulfite.

(a) Sodium hydrosulfite must be packed in specification containers as follows:

(1) Specification 15A, 15B, 15C, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside glass bottles not exceeding 5 pounds capacity each, or metal containers.

(2) Specification 6B, or 6C (§§ 178.98, 178.99 of this subchapter). Metal barrels or drums.

(3) Spec. 17E, 17H, or 37K (§§ 178.116, 178.118, or § 178.130 of this subchapter) Metal drums (single-trip).

(4) Specification 37A or 37B (§§ 178.131, 178.132 of this subchapter). Metal drums (STC). Not authorized for transportation by air. Authorized for transportation by water only when the containers are fitted with a minimum 4-mil polyethylene liner, the drum covers contain sponge rubber gaskets, the drums are closed with a bolted ring closure and the gross weight is not over 275 pounds.

(5) Spec. 21C (§ 178.224 of this subchapter). Fiber drums with inside metal drums. Authorized net weight not over 225 pounds.

(6) Spec. 21C (§ 178.224 of this subchapter). Fiber drums. Authorized net weight of product not over 250 pounds; drums must have a metal foil (laminated between two sheets of kraft paper with thermoplastic adhesive) moisture and water barrier wound into the sidewall of the drum and located not more than 2 plies from the interior of drum but not to be wound as the first ply; a metal foil moisture and water barrier must also be present in the fiber or wood heading; exterior of drum sidewall must be protected with a water resistant coating; in addition to the tests prescribed by § 178.224-2(a), (b), and (c) of this subchapter, a drum having been given a 4-foot diagonal bottom chime drop must, after being emptied, withstand complete immersion of the bottom in 6 inches of water for 4 hours without leakage to the interior; drums must not be offered for transportation by carriers by water.

(7) Spec. 22B (§ 178.197 of this subchapter). Plywood drums with inside metal drums.

(8) Specification 56 (§§ 178.251, 178.252 of this subchapter). Portable tank. Authorized only for shipment in a closed transport vehicle. For rail transportation see § 174.63 of this subchapter. Not authorized for transportation by water.

[29 FR 18709, Dec. 29, 1964, as amended by Order 67, 30 FR 7421, June 5, 1965. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.204, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.205 Sodium picramate, wet.

(a) Sodium picramate must be wet with not less than 20 percent of water by weight and packed in specification containers as follows:

(1) Specification 15A, 15B, 15C, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside glass containers not exceeding 1-quart capacity each, and cushioned in outside container.

(2) Specification 21P (§ 178.225 of this subchapter). Fiber drum overpack with inside polyethylene container meeting all requirements of Specification 2U (§ 178.24 of this subchapter) except removable head is authorized. Fiber drum must be rated for a minimum net weight of 600 pounds. Maximum gross weight shall not exceed 400 pounds.

[29 FR 18709, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.205, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.206 Sodium or potassium, metallic; sodium amide; sodium potassium alloys; sodium aluminum hydride; lithium metal; lithium silicon; lithium ferro silicon; lithium hydride; lithium borohydride; lithium aluminum hydride; lithium acetylide-ethylene diamine complex; aluminum hydride; cesium metal; rubidium metal; zirconium hydride, powdered.

(a) Metallic sodium or potassium, sodium amide, sodium potassium alloys, sodium aluminum hydride, lithium metal, lithium silicon, lithium ferro silicon, lithium hydride, lithium borohydride, lithium aluminum hydride, lithium acetylide-ethylene diamine complex, aluminum hydride, cesium metal, rubidium metal, and powdered zirconium hydride must be packaged as follows:

(1) Specification 15A, 15B, 19A, or 19B (§§ 178.168, 178.169, 178.190, 178.191 of this subchapter). Wooden boxes must have inside air-tight metal packagings. Each inside air-tight metal packaging must have a closing device securely fastened by positive means (not friction). For shipments of lithium aluminum hydride, each inside metal packaging must not exceed 1 gallon capacity and must be securely closed, positive means not required. Each inside metal packaging containing lithium aluminum hydride must be cushioned in outside packagings with sufficient incombustible packaging material.

(2) Specification 5, 5C, 6B, or 6C (§§ 178.80, 178.83, 178.98, 178.99 of this subchapter). Metal barrels or drums. Not authorized for lithium aluminum hydride or aluminum hydride.

(3) Spec. 17E, 17H, 37A, or 37B (§§ 178.116, 178.118, 178.131, or § 178.132 of this subchapter). Metal drums (single-trip). Authorized only for lithium metal or sodium, metallic which must be fused solid in the container.

(4) Spec. 37A or 37B (§ 178.131 or § 178.132 of this subchapter). Metal drums (single-trip) not exceeding 6 gallons capacity each, with welded side seams and hermetically sealed closure or closure made fast by positive pressure of the lid against a rubber gasket with edge of the lid crimped over the lip of the drum and a protective metal ring fastened around the crimped edge, cushioned on all sides with incombustible packing material, packed in strong outside wooden boxes (see § 173.25). Not more than four inside metal drums shall be packed in one outside wooden box.

(5) Spec. 17C (§ 178.115 of this subchapter), metal drums (single-trip). Not authorized for lithium aluminum hydride.

(6) Spec. 17H or 37A (§ 178.118 or § 178.131 of this subchapter). Metal drums (single-trip), with air-tight metal inside containers which must have closing device securely fastened by positive means (not friction). Inside metal containers must be cushioned on all sides by incombustible packing material. Authorized for lithium metal or lithium hydride only.

(7) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes constructed of at least 375-pound test (Mullen or Cady) solid fiberboard with inside airtight metal container which must have a closing device securely fastened by positive means (not friction). Each inside metal container must be individually nested into a double-faced corrugated partition of at least 200-pound test (Mullen or Cady) which is in turn surrounded on all sides by a peripheral double-walled corrugated liner of at least 200-pound test (Mullen or Cady). Authorized gross weight not over 90 pounds.

(8) Spec. 21C (§ 178.224 of this subchapter). Fiber drums constructed for 400 pounds net weight, with the material packed not more than 5 pounds net weight each in not to exceed one-half gallon steel cans equipped with friction-top closures. Authorized for lithium ferro silicon only.

(9) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes with non-sparking inside metal cans securely closed by use of plastic tape, or other efficient means to provide moisture tight seal. Authorized only for lithium metal in ribbon form not over ½ inch wide and 1/16 inch thick. Lithium metal ribbon must be coated with heavy mineral oil or petrolatum and be wound on motion picture film reels not over 1,600-foot capacity each.

(10) Tubes of stainless steel, or other metals of equivalent strength and nonreactivity, having sealed, welded end caps, and containing not more than 50 grams of metal. Authorized only for metallic sodium, metallic lithium, metallic potassium, and sodium potassium alloy. Each tube must be enclosed within a secondary sealed metallic tube and further enclosed within strong tight outer packaging.

(11) Specification 12B (§ 178.205 of this subchapter). Fiberboard box. Authorized only for lithium metal in wire form. Fiberboard box must have inside nonsparking metal packaging. Each inside nonsparking metal packaging must be tin coated and sealed by rolled-on lids. The contents of each inside packaging must be coated with heavy mineral oil or petroleum and wound on a 3-inch by 3-inch nonsparking metal spool. The net weight of the contents in each inside packaging must not exceed one-fourth pound.

(12) Any packaging as prescribed in § 173.416 or § 173.417(b).

(13) Specification 21C (§ 178.224 of this subchapter). Fiber drums with inside hermetically sealed tin-coated steel cans with a minimum wall thickness of 0.015 inch. Not more than four spools made of non-sparking material may be packed in each inside container with not more than 2½ pounds net weight of product in each inside container. Each metal can shall be individually separated with double-faced corrugated partitions and noncombustible packaging material. Authorized only for lithium metal in ribbons.

(b) Sodium or potassium, metallic, sodium amide, and lithium metal, immersed in neutral oil may also be shipped when packed in specification containers as follows:

(1) Specification 15A, 15B, or 19B (§§ 178.168, 178.169, 178.191 of this subchapter). Wooden boxes with inside metal drums, Spec. 37A or 37B (§§ 178.131, 178.132 of this subchapter) having welded side seams, net weight not over 30 pounds, or with inside glass containers, each enclosed in a tin container.

(2) Spec. 17H (§ 178.118 of this subchapter). Metal drum (single-trip). Authorized only for lithium metal in the form of cups or ingots.

(c) Sodium, metallic, may also be shipped when packed in specification containers as follows:

(1) Spec. 105A300-W (§§ 179.100 and 179.101 of this subchapter). Tank cars, having exterior heater coils fusion welded to tank shell and properly stress-relieved, the material to be in molten condition when loaded into the tank and allowed to solidify before car is offered to the carrier. Outage must be 5 percent or more for sodium at fusion temperature of 208° F.

(2) Specifications 17C, 17H, 37A, or 37B (§§ 178.115, 178.118, 178.131, or § 178.132 of this subchapter) metal drums (single-trip). These drums are authorized for cylindrical blocks which must be at least 2 inches in diameter and not less than 6 inches in length, or rectangular blocks not less than 6 inches in length and not less than 2 inches in any other dimension.

(3) Specification MC 330 or MC 331 (§ 178.337 of this subchapter). Tank motor vehicles having a minimum design pressure of 150 pounds per square inch and having exterior coils fusion-welded to the tank shell and properly stress-relieved. Tanks must be equipped with safety valves having a start-to-discharge pressure not exceeding 150 pounds per square inch. The material must be in molten condition when loaded and solidified before being moved over a public highway. Outage must be 5 percent or more at a sodium temperature of 208° F.

(4) Specification 51 (§ 178.245 of this subchapter). Portable tank. Each tank must have a minimum design pressure of 150 p.s.i.g. Each tank must be equipped with safety valves having a start-to-discharge pressure of 150 p.s.i.g. If a tank has exterior heating coils these coils must be welded to the tank and must be stress relieved. The material must be in molten condition when loaded and the tank must be held for sufficient time to allow the material to be completely solidified before being offered for transportation. Outage must be five percent or more at sodium fusion temperature of 208° F.

(d) Limited quantities of lithium metal in cartridges or rubidium metal in cartridges is excepted from labeling (except when offered for transportation by air) and specification packaging requirements, when packaged according to the following paragraph. In addition, shipments are not subject to Subpart F of Part 172 of this subchapter, to Part 174 of this subchapter except § 174.24 and to Part 177 of this subchapter except § 177.817.

(1) In inside hermetically sealed metal cartridges not exceeding 18 grams net weight each, packed in strong outside packagings with net weight of lithium or rubidium metal not exceeding one pound; which outside packaging may be further overpacked in strong wooden boxes or fiber drums provided total net weight of lithium or rubidium metal in one outside box or drum does not exceed one pound.

(e) Lithium metal or rubidium metal in cartridges, containing more than 18 grams but not more than 120 grams of lithium or rubidium, must be packed in specification packagings as follows:

(1) Specification 15A, 15B, 19A, or 19B (§§ 178.168, 178.169, 178.191 of this subchapter). Wooden boxes with inside air-tight copper cartridges having a minimum wall thickness of 0.02-inch. Cartridges having less than 0.022 inch wall thickness must be separated or securely cushioned in the boxes. Gross weight must not exceed 75 pounds.

(f) Lithium batteries comprised of one or more cells are not subject to the requirements of this subchapter, if they meet the following requirements.

(1) Each cell may contain no more than 0.5 gram of lithium or lithium alloy.

(2) Each battery may contain an aggregate quantity of no more than 1 gram of lithium or lithium alloy.

(3) Each cell must be hermetically sealed.

(4) Cells must be separated so as to prevent short circuits.

(5) Batteries must be packed in strong outside packagings except when installed in electronic devices.

(6) If a battery contains more than 0.5 gram of lithium or lithium alloy, it may not contain a liquid or gas that is a hazardous material according to this subchapter unless the liquid or gas, if free, would be completely absorbed or neutralized by other materials in the battery.

[29 FR 18709, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.206, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.207 Sulfide of sodium or sulfide of potassium, fused or concentrated, when ground.

(a) Sulfide of sodium or sulfide of potassium, fused or concentrated, when ground, must be packed in specification containers as follows:

(1) Specification 15A, 15B, 15C, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside bottles enclosed in tightly closed metal cans, or hermetically sealed (soldered) metal cans.

(2) Specification 6B, or 6C (§§ 178.98, 178.99 of this subchapter). Metal barrels or drums.

(3) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes, with inside containers which must be hermetically sealed (soldered) metal cans of not over 5 pounds capacity.

(b) When fused or concentrated, but not ground (may be chipped, flaked, or broken), may be shipped in specification containers as follows:

(1) Specification 15A, 15B, 15C, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside bottles of not more than 5 pounds capacity each, or tightly sealed metal cans.

(2) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes with inside containers which must be metal cans of not over 5 pounds net weight each or glass bottles of not over 1 pound net weight each. Packages containing glass or earthenware containers must not weigh over 65 pounds gross.

(3) Spec. 17E, 17H, 37A, or 37B (§§ 178.116, 178.118, 178.131, or § 178.132 of this subchapter). Metal drums (single-trip).

(4) Specification 6B or 6C (§§ 178.98, 178.99 of this subchapter). Metal barrels or drums.

(5) Spec. 21C (§ 178.224 of this subchapter). Fiber drums which must be lined or coated, or otherwise treated so as to prevent the entrance of moisture in quantities sufficient to create a hazardous condition in transportation; maximum loaded capacity 250 pounds net.

(6) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes constructed of at least 275-pound test double-faced fiberboard and provided with a perimeter liner and bottom pad of at least 200-pound test fiberboard. Boxes constructed of at least 350-pound fiberboard having top and bottom pads shall not require perimeter liner. Product must be contained within a tightly closed polyethylene or other equally efficient plastic bag constructed of material having minimum thickness of 0.004 inch. Not more than 25 pounds net weight of product may be packed in one outside box.

(7) Spec. 12A (§ 178.210 of this subchapter). Fiberboard boxes with inside glass bottles not over 5 pounds capacity each. Not more than four bottles having capacity of 5 pounds each shall be packed in one outside box. Shipper must have established that completed package meets test requirements prescribed by § 178.210-10 of this subchapter.

(c) Sulfide of potassium, crystallized, is not subject to Parts 170-189 and 397 of this title.

(d) Sodium sulfide when shipped fused in one solid mass in a metal barrel or drum and sodium sulfide, crystallized, are not subject to Parts 170-189 and 397 of this title.

(e) Sodium sulfide containing 35 percent or more combined water by weight, fused or concentrated but not ground (may be chipped, flaked, or broken), when packed in steel barrels or drums or portable metal tanks that are equipped with moisture-tight closures, or in strong tight fiber drums having a moisture-barrier incorporated in the walls and equipped with moisture-tight closures, is not subject to Parts 170-189 and Part 397 of this Title. Portable tanks filled to gross weight to be shipped must be capable of withstanding a drop from a height of 4 feet onto solid concrete without rupture or serious damage, and must be equipped with lifting devices capable of holding 4 times the gross weight of filled tank.

[29 FR 18709, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-14, 45 FR 59890, Sept. 11, 1980; Amdt. 173-142, 45 FR 81571, Dec. 11, 1980; Amdt. 173-149, 46 FR 49897, Oct. 8, 1981]

§ 173.206 Titanium metal powder, wet or dry.

(a) *Titanium metal powder, wet.* Titanium metal powder, wet, with not less than 20 percent water, must be packed in specification containers as follows:

(1) Specification 15A, 15B, or 19B (§§ 178.168, 178.169, 178.191 of this subchapter). Wooden boxes with inside metal cans not exceeding 1-gallon each, and not more than 12 metal cans in one outside box; or not more than 1 inside metal can of not

less than 22-guage metal and not over 10 gallons capacity. Metal cans must be tightly closed.

(2) Titanium metal powder, wet, with not less than 50 percent water by weight may be packed in any full removable head drum specified in § 173.154.

(b) *Titanium metal powder, dry.* Titanium metal powder, dry, must be packed in specification containers as follows:

(1) Specification 15A, 15B, or 19B (§§ 178.168, 178.169, 178.190, 178.191 of this subchapter). Wooden boxes with inside metal containers, closed by push-in covers, held in place by soldering at least four points, or in screw-cap metal cans. Inside containers must not exceed 10 pounds net weight each and must be cushioned by an incombustible material. Gross weight not to exceed 75 pounds.

(2) Spec. 17H or 37A (§ 178.118 or § 178.131 of this subchapter). Metal barrels or drums (single-trip) with inside metal drum of not less than 20-gauge metal and with closure secured by positive means. The inside container shall be completely surrounded by not less than 1 inch of incombustible cushioning material.

(3) Spec. 5B (§ 178.82 of this subchapter). Metal barrels or drums not over 15 gallons capacity.

(4) Specification 17C (§ 178.115 of this subchapter). Metal drums (single trip) not over 30-gallon capacity.

[29 FR 18709, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.208, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.212 Trinitrobenzene and trinitrotoluene, wet.

Trinitrobenzene and trinitrotoluene, wet with not less than 10 percent water, in quantity not exceeding 16 ounces in one outside package, may be shipped as drugs, medicines, or chemicals, when in glass bottles securely stoppered, each bottle inclosed in a strong fiber carton properly cushioned in the outside shipping case and are not subject to any other requirement of Parts 170-189 and 397 of this title.

§ 173.214 Hafnium metal or zirconium metal, wet, minimum 25 percent water by weight, mechanically produced, finer than 270 mesh particle size; hafnium metal or zirconium metal, dry, in an atmosphere of inert gas, mechanically produced, finer than 270 mesh particle size; hafnium metal or zirconium metal, wet, minimum 25 percent water by weight, chemically produced (see Note 1), finer than 20 mesh particle size; hafnium metal or zirconium metal, dry, in an atmosphere of inert gas, chemically produced (see Note 1), finer than 20 mesh particle size.

NOTE 1: Produced by means other than attrition or grinding.

NOTE 2: Any product containing 10 percent or more, particle size specified, shall be subject to this section.

NOTE 3: Any product containing less than 25 percent water by weight is considered dry for purposes of these regulations.

(a) Hafnium metal, wet, mechanically produced finer than 270 mesh particle size or chemically produced finer than 20 mesh particle size with a minimum of 25 percent water by weight (a mixture of water and a suitable antifreeze agent may be used when freezing temperatures may be encountered during transportation) must be packed in specification containers as follows:

(1) Specification 15A, 15B, or 19B (§§ 178.168, 178.169, 178.191 of this subchapter). Wooden boxes or Spec. 6B or 6C (§§ 178.98, 178.99 of this subchapter) metal drums with inside glass or noncarbon polyethylene containers having net weight of not over 10 pounds each. Inside glass containers must be equipped with positive type clamp-on closures equipped with rubber gaskets. Inside polyethylene containers must have screw-cap closures equipped with gaskets ahead of thread and shall be of material which will not react with or be decomposed when in contact with contents. Screw-cap closures must be secured in place by suitable tape. Each glass or polyethylene container must be surrounded on all sides with not less than 1-inch of incombustible cushioning material and in an amount sufficient to completely absorb the entire liquid contents of the containers. Each inside glass or polyethylene container must be placed in a strong tight metal can

closed with push-in cover held in place by soldering or crimping at least four points. The authorized net weight of hafnium in one outside container shall not exceed 40 pounds for wooden boxes and shall not exceed 150 pounds for steel drums.

(b) Hafnium metal, dry, in an atmosphere of inert gas, mechanically produced finer than 270 mesh particle size or chemically produced finer than 20 mesh particle size must be packed in specification containers as follows:

(1) Specification 6B or 6C (§§ 178.98, 178.99 of this subchapter) or Spec. 17C, 17H, or 37A (single-trip containers) (§§ 178.115, 178.118, 178.131 of this subchapter). Metal barrels or drums with inside non-carbon polyethylene bottles having positive type clamp on closures equipped with rubber gaskets, or with screw-cap closures having not less than three continuous threads and equipped with gaskets ahead of threads, not over 5 pounds net weight capacity each. Screw-cap closures must be secured in place by suitable tape. Each bottle must be placed in a Specification 2R (§ 178.34 of this subchapter) metal container having a wall thickness of one-fourth inch and be completely surrounded by cushioning material. Specification 2R containers must be separated from one another by incombustible cushioning material. The authorized net weight of metal in one outside container shall not exceed 150 pounds.

(c) Zirconium metal, wet, mechanically produced finer than 270 mesh particle size or chemically produced finer than 20 mesh particle size with a minimum of 25 percent water by weight (a mixture of water and a suitable antifreeze agent may be used when freezing temperatures may be encountered during transportation) must be packed in specification containers as follows:

(1) Specification 15A, 15B, or 19B (§§ 178.168, 178.169, 178.191 of this subchapter). Wooden boxes or Spec. 6B or 6C (§§ 178.98, 178.99 of this subchapter) or Spec. 17C or 17H (§§ 178.115, 178.118 of this subchapter) metal drums with inside glass or noncarbon polyethylene containers having net weight of not over 10 pounds each. Inside glass containers must be equipped with positive type clamp-on closures equipped with rubber gaskets. Inside polyethylene containers must have screw-cap closures equipped with gaskets ahead of the thread and shall be of material which will not react with or be decomposed when in contact with contents. Screw-cap closures must be secured in place by suitable tape. Each glass or polyethylene container must be surrounded on all sides with not less than 1-inch of incombustible cushioning material and in an amount sufficient to completely absorb the entire liquid contents of the containers. Each inside glass or polyethylene container must be placed in a strong metal can closed with push-in cover held in place by soldering or crimping at at least four points. The authorized net weight or zirconium in one outside container shall not exceed 40 pounds in wooden boxes and 150 pounds in steel drums.

(2) [Reserved]

(3) Spec. 37P (§ 178.133 of this subchapter). Steel drums with polyethylene liner of one-piece molded construction (nonreusable container) not over 5 gallons capacity each. Drums exceeding 1 gallon capacity must be constructed of at least 24-gauge metal.

(4) Specification 37M (§ 178.134 of this subchapter). Cylindrical steel overpack with inside specification 2S (§ 178.35 of this subchapter) polyethylene container. Each overpack must be constructed of at least 24-gage steel. Each packaging may not exceed a capacity of 5 gallons. Net weight of contents may not exceed 50 pounds of dry material.

(5) Specification 6D (§ 178.102 of this subchapter). Cylindrical steel overpack with inside specification 2S (§ 178.35 of this subchapter) noncarbon polyethylene container. Container is limited to single trip only and may not exceed a capacity of 5 gallons. Net weight of contents must not exceed 50 pounds of dry material.

(d) Zirconium metal, dry, in an atmosphere of inert gas, mechanically produced finer than 270 mesh particle size or chemically produced finer than 20 mesh particle size must be packed in specification containers as follows:

(1) Specification 6B or 6C (§§ 178.98, 178.99 of this subchapter) or Specifica-

tion 17C, 17H, or 37A (single-trip containers) (§§ 178.115, 178.118, 178.131 of this subchapter). Metal barrels or drums with inside non-carbon polyethylene bottles having positive type clamp-on closures equipped with rubber gaskets, or with screw-cap closures having not less than three continuous threads and equipped with gaskets ahead of threads, not over 5 pounds net weight capacity each. Screw-cap closures must be secured in place by suitable tape. Each bottle must be placed in a Specification 2R (§ 178.34 of this subchapter) metal container having a wall thickness of one-fourth inch and be completely surrounded by cushioning material. Specification 2R containers must be separated from one another by incombustible cushioning material. The authorized net weight of metal in one outside container shall not exceed 150 pounds.

(e) Mechanically produced hafnium metal, coarser than 270 mesh particle size and chemically produced coarser than 20 mesh particle size in strong tight containers are not subject to Parts 170-189 of this subchapter and Part 397 of this Title.

(f) Mechanically produced zirconium metal, coarser than 270 mesh particle size and chemically produced coarser than 20 mesh particle size in strong tight containers are not subject to Parts 170-189 and 397 of this title. (See § 173.220, zirconium scrap.)

[29 FR 18709, Dec. 29, 1964, as amended by Order 66, 30 FR 5745, Apr. 23, 1965. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.214, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.216 Zirconium picramate, wet.

(a) Zirconium picramate must be wet with not less than 20 percent of water by weight and packed in specification containers as follows:

(1) Specification 15A, 15B, 15C, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside glass containers of not over 1-quart capacity each, tightly stoppered and cushioned.

[29 FR 18709, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-81, 39 FR 17318, May 15, 1974; Amdt. 173-94, 41 FR 16072, Apr. 15, 1976; Amdt. 173-149, 46 FR 49898, Oct 8, 1981]

§ 173.217 Calcium hypochlorite, hydrated, Calcium hypochlorite mixture, dry; lithium hypochlorite mixture, dry; mono-(trichloro) tetra-(monopotassium dichloro)-penta-s-triazinetrione, dry; potassium dichloro-s-triazinetrione, dry; sodium dichloro-s-triazinetrione, dry; trichloro-s-triazinetrione, dry.

(a) Calcium hypochlorite, hydrated, calcium hypochlorite mixture, dry, lithium hypochlorite mixture, dry, mono-(trichloro) tetra-(monopotassium dichloro)-penta-s-triazinetrione, dry, potassium dichloro-s-triazinetrione, dry, sodium dichloro-s-triazinetrione, dry, and trichloro-s-triazinetrione, dry, each containing more than 39 percent available chlorine must be packaged as follows:

(1) Specification 6B, or 6C (§§ 178.98, 178.99 of this subchapter). Metal barrels or drums.

(2) Spec. 17E, 17H, 37A, or 37B (§§ 178.116, 178.118, 178.131, or § 178.132 of this subchapter). Metal drums (single-trip).

(3) Specification 21C (§ 178.224 of this subchapter). Fiber drums with inner ply consisting of a laminated sheet of paper and aluminum foil, internally coated. Cover of drum must be gasketed. Authorized net weight not over 400 pounds.

(4) Specification 21C (§ 178.224 of this subchapter). Fiber drum with commodity packed in securely closed polyethylene bag constructed of polyethylene film not less than 0.004-inch thickness. Not authorized for calcium hypochlorite mixtures and lithium hypochlorite compounds, dry.

(5) Specification 21C (§ 178.224 of this subchapter). Fiber drum must be made with integral inner body ply having 0.003-inch minimum thickness aluminum facing and bottom inner ply having 0.001-inch minimum thickness aluminum facing. Cover of drum must be gasketed. Authorized net weight not over 400 pounds. Authorized only for dry calcium hypochlorite mixtures.

(6) Specification 56 (§§ 178.251, 178.252 of this subchapter). Metal portable tank. Authorized only for calcium hypochlorite, hydrated; mono-

(tri-chloro) tetra-(monopotassium dichloro)-penta-s-triazinetrione, dry, potassium dichloro-s-triazinetrione, dry; sodium dichloro-s-triazinetrione, dry; and trichloro-s-triazinetrione, dry. For rail transportation, see § 174.63(b) of this subchapter.

(7) Specification 35 (§ 178.16 of this subchapter) non-reusable, removable head polyethylene drum for use without overpack and not over seven gallons capacity.

(8) Specification 12B (§ 178.205 of this subchapter). Fiberboard boxes with inside polyethylene bottles with a minimum wall thickness of 0.015 inch. Not more than 2 polyethylene bottles may be packed in one box and each bottle must not contain more than 20 pounds net weight of the material. Packaging must be such that is will not react dangerously with or be decomposed by the commodity.

(9) Specification 12B (§ 178.205 of this subchapter). Fiberboard box with not more than two inside minimum 30-gauge thick steel pails containing not over 26 pounds net weight each. Each cover must be gasketed.

(b) As prescribed in § 173.163(a)(7). Authorized only for calcium hypochlorite, hydrated.

(c) Limited quantities of these materials in strong outside wooden or fiberboard packages with inside packagings of glass not over 5 pounds capacity each, or with inside metal packagings or plastic bottles or drums not over 10 pounds capacity each, are excepted from labeling and (except labeling is required for transportation by air) and the specification packaging requirements of this subchapter. In addition, shipments are not subject to Subpart F of Part 172 of this subchapter, to Part 174 of this subchapter except § 174.24 and to Part 177 of this subchapter except § 177.817.

[29 FR 18709, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.217, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.218 Isopropyl percarbonate, unstabilized.

(a) Isopropyl percarbonate, unstabilized, must be packed in specification containers as follows:

(1) Specification 15A, 15B, 15C, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside glass, earthenware, or metal containers, of not over 2 gallons capacity each which must be maintained at a temperature below 0° F. Shipments are authorized for transportation by private or contract carrier by motor vehicle only.

[29 FR 18709, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16073, Apr. 15, 1976; Amdt. 173-138, 45 FR 32696, May 19, 1980; Amdt. 173-149, 46 FR 49898, Oct. 8, 1981]

§ 173.219 Potassium perchlorate.

(a) Potassium perchlorate must be packed as follows:

(1) As prescribed in § 173.154 (a)(1) to (a)(11) and (a)(14). Plastic bottles may be substituted for the inside glass bottles prescribed in § 173.154(a)(6).

[29 FR 18709, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-104, 42 FR 11239, Feb. 28, 1977]

§ 173.220 Magnesium or zirconium scrap consisting of borings, clippings, shavings, sheets, turnings, or scalpings, and magnesium metallic (other than scrap), powder, pellets, turnings, or ribbon; magnesium aluminum powder.

(a) Magnesium or zirconium scrap consisting of borings, shavings, or turnings, must be packed in closed metal barrels or drums, wooden barrels, metal pails, fiber drums, or four-ply paper bags. Paper bags are not authorized for less-than-carload or less-than-truckload shipments.

(1) Magnesium or zirconium scrap consisting of clippings, scalpings, or scrap sheets may be shipped in bulk in carload or truckload quantities. Cars must be tight box cars or tightly closed steel covered gondola cars and trucks or trailers must have closed or completely covered bodies.

(2) Limited quantities of magnesium or zirconium scrap consisting of clippings, scalpings, or scrap sheets in

closed metal drums, wooden barrels, or wooden boxes, unless otherwise provided, is excepted from labeling (except when offered for transportation by air) and specification packaging requirements of this subchapter. In addition, shipments are not subject to Subpart F of Part 172 of this subchapter, to Part 174 of this subchapter except § 174.24 and to Part 177 of this subchapter except § 177.817.

(b) Magnesium metallic (other than scrap), powder, pellets, turnings or ribbon, magnesium aluminum powder, must be packed in containers as prescribed in § 173.154.

(1) Limited quantities of magnesium metallic (other than scrap), pellets, turnings, or ribbon in fiberboard boxes with inside glass bottles not over 1 pound capacity each, with not more than 25 pounds net weight of product in each outside fiberboard box, in closed metal drums, metal pails, fiber drums, or wooden boxes with inside packagings are, unless otherwise provided excepted from labeling (except labeling is required for transportation by air) and the specification packaging requirements of this subchapter. In addition, shipments are not subject to Subpart F of Part 172 of this subchapter, to Part 174 of this subchapter except § 174.24 and to Part 177 of this subchapter except § 177.817.

(2) Specification 56 (§ 178.252 of this subchapter). Portable tank. Not authorized for transportation by water. For magnesium powder or magnesium aluminum powder, the following additional requirements must also be met:

(i) The tank must be pressurized with 2 psig of nitrogen before shipment and the pressure relief valve must have a maximum setting of 3 psig; and

(ii) The tank must have both a sift-proof valve with a locking pin and a plug or blind flange on the bottom opening.

[29 FR 18709, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.220, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.221 Liquid organic peroxides, n.o.s., and liquid organic peroxide solutions, n.o.s.

(a) Liquid organic peroxides, n.o.s., and liquid organic peroxide solutions, n.o.s. must be packed in packagings which may be equipped with venting devices wherever necessary to prevent excessive pressure buildup, as follows:

(1) Specification 1A, 1D, or 1M (§§ 178.1, 178.4, 178.17 of this subchapter). Glass carboys in boxes or expanded polystyrene packagings. Rated capacity may not exceed 5 gallons for Specification 1A. Not authorized for transportation by aircraft.

(2) Specification 15A, 15B, 15C, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside glass, earthenware, or metal containers, not over 1-gallon each, cushioned with incombustible packing material in sufficient quantity to absorb any leakage. Metal containers authorized only for materials which will not react dangerously with or be decomposed by contact with metal.

(3) Specification 12B (§ 178.205 of this subchapter). Fiberboard box with Specification 2E (§ 178.24a of this subchapter) inside polyethylene bottles, or with glass or metal inside receptacles, not over 1 gallon each. Not more than six 1-gallon polyethylene bottles may be packed in one fiberboard box. Not more than one 1-gallon glass or metal inside receptacle, which must be cushioned with noncombustible packing material in sufficient quantity to absorb the contents of the inner receptacle, may be packed in one fiberboard box. Metal and polyethylene inside receptacles authorized only for material which will not react dangerously with or be decomposed by contact with metal or polyethylene.

(4) Spec. 42B (§ 178.107 of this subchapter). Aluminum drums not over 15 gallons capacity. Authorized only for peroxides which will not react dangerously with the aluminum or be decomposed by contact with it.

(5) Spec. 17C or 17E (§§ 178.115 or 178.116 of this subchapter). Metal drums (single-trip) not over 15 gallons capacity Authorized only for material which will not react dangerously with

the drum metal, or be decomposed by contact with it.

(6) Spec. 22C (§ 178.198 of this subchapter). Plywood drum as prescribed by § 178.198-2(a) of this subchapter, with inside spec. 2T (§ 178.21 of this subchapter) polyethylene container. Authorized only for material which will not react dangerously with or cause decomposition of the polyethylene.

(7) Specification 6D or 37M (nonreuseable container) (§§ 178.102, 178.134 of this subchapter). Cylindrical steel overpacks with inside Specifications 2S or 2SL (§§ 178.35, 178.35a of this subchapter) polyethylene containers. Authorized only for materials which will not react dangerously with or cause decomposition of the polyethylene.

(8) Spec. 37P (§ 178.133 of this subchapter). Steel drums, not over 5-gallons capacity, with one-piece seamless molded polyethylene liner (nonreusable container). Drums exceeding 1-gallon capacity must be constructed of at least 24-gauge metal. Authorized only for materials that will not react with polyethylene and result in container failure.

(9) Specification 12P (§ 178.211 of this subchapter). Fiberboard box with one inside specification 2U (§ 178.24 of this subchapter) polyethylene container of not over 6-gallon capacity, or two inside specification 2U polyethylene containers of not over 2½ gallon capacity each. Wire staples are not authorized for assembly or closure of boxes, except when polyethylene container is completely enclosed in inside boxes free of wire staples or other projections that could cause failures. Not authorized for transportation by air.

(10) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes with inside polyethylene bottles, not over 5-gallons capacity each, as specified by § 178.205-34 of this subchapter. Not more than one bottle shall be packed in one outside box. Authorized only for material which will not react dangerously with or cause decomposition of polyethylene.

(11) Specification 16A (§ 178.185 of this subchapter). Wooden boxes with inside Specification 2U, 2S, or 2SL (§§ 178.24, 178.35, 178.35a of this subchapter) polyethylene containers, not over 5-gallon capacity each. Specification 2U container must have a minimum wall thickness of 0.015 inch. The polyethylene container must be separated from the wooden box by a complete corrugated fiberboard liner, top pad, and bottom pad. Authorized only for materials which will not react dangerously with or be decomposed by contact with polyethylene.

(12) Specification 34 (§ 178.19 of this subchapter). Polyethylene drum. The shipper shall assure conformance with the requirements of § 173.24(d) of this part prior to first shipment.

(13) Specification 57 (§ 178.253 of this subchapter). Metal portable tanks. Tanks are authorized only for tert-butyl cumyl peroxide. The tank may not be filled to more than 90 percent capacity.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[29 FR 18709, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.221, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.222 Acetyl peroxide and acetyl benzoyl peroxide, solution.

(a) Acetyl peroxide must be shipped in solution in a non-volatile solvent and must contain not more than 25 percent by weight of the peroxide. Acetyl benzoyl peroxide must be shipped in solution in a non-volatile solvent and must contain not more than 40 percent by weight of the peroxide. They must be packed in specification containers as follows:

(1) Specification 15A, 15B, 15C, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside glass or earthenware containers not over 1-gallon each, cushioned with incombustible packing material in sufficient quantity to absorb any leakage.

(2) Specification 1A, 1D, or 1M (§§ 178.1, 178.4 178.17 of this subchapter). Glass carboys in boxes or expanded polystyrene packagings. Rated capacity may not exceed 5 gallons for Specification 1A. Not authorized for transportation by aircraft.

(3) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes with inside containers which must be glass or earthenware, not over 1 gallon each, cushioned with incombustible packing material in sufficient quantity to absorb the contents of the inner container. Not more than one 1-gallon inside container shall be packed in one outside fiberboard box.

(4) Specification 12P (§ 178.211 of this subchapter). Fiberboard box with one inside specification 2U (§ 178.24 of this subchapter) polyethylene container of not over 5-gallon capacity, or two inside specification 2U polyethylene containers of not over 2½ gallon capacity each. Wire staples are not authorized for assembly or closure of boxes, except when polyethylene container is completely enclosed in inside boxes free of wire staples or other projections that could cause failures. Not authorized for transportation by air.

(5) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes with inside polyethylene bottles, not over 5 gallons capacity each, as specified by § 178.205-34 of this subchapter. Not more than one bottle shall be packed in one outside box. Authorized only for material which will not react dangerously with or cause decomposition of polyethylene.

(6) Specification 34 (§ 178.19 of this subchapter). Polyethylene drum. The shipper shall assure conformance with the requirements of § 173.24(d) of this part prior to first shipment.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[29 FR 18709, Dec. 29, 1964, as amended by Order 66, 30 FR 5745, Apr. 23, 1965. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.222, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.223 Peracetic acid.

(a) Peracetic acid must be shipped in solution not exceeding 40 percent strength and must be packed in specification containers as follows:

(1) Specification 15A, 15B, 15C, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside glass, earthenware, or polyethylene containers not over 1-gallon capacity each, cushioned with sterile absorbent cotton or other cushioning material which will not react with the contents to generate heat. Polyethylene container must have a vented closure capable of preventing leakage of liquid contents. Cushioning material must be in sufficient quantity to absorb any leakage. Boxes with inside polyethylene containers must be marked "Keep This Side Up."

(2) Spec. 12B (§ 178.205 of this chapter). Fiberboard boxes with inside containers which must be glass or earthenware, not over one quart capacity each, cushioned with sterile absorbent cotton or other cushioning material which will not react with the contents to generate heat. Cushioning material must be in sufficient quantity to completely absorb the contents of the inner container.

(3) Specification 1D or 1M (§§ 178.4, 178.17 of this subchapter). Glass carboys in boxes or expanded polystyrene packagings. Not authorized for transportation by aircraft.

(4) Spec. 22C (§ 178.198 of this subchapter). Plywood drum as prescribed by § 178.198-2(a) of this subchapter, with inside Spec. 2T (§ 178.21 of this subchapter) polyethylene container.

(5) Specification 6D or 37M (nonreusable container) (§§ 178.102, 178.134 of this subchapter). Cylindrical steel overpacks with inside Specifications 2S or 2SL (§ 178.35 of this subchapter) polyethylene containers not over 55-gallon capacity. Polyethylene container must have a vented closure capable of preventing leakage of liquid contents.

(6) Specification 21P (§ 178.225 of this subchapter). Fiber drum overpack with inside Specification 2SL (§ 178.35a of this subchapter) polyethylene container not over 30-gallon capacity. Container must have a vented closure to prevent accumulation of internal pressure and the head with closure must be marked "Keep This End Up".

(7) Specification 34 (§ 178.19 of this subchapter). Polyethylene drum. The shipper shall assure conformance with the requirements of § 173.24(d) of this part prior to first shipment.

(b) Limited quantities of peracetic acid solutions not exceeding 40 percent strength packed in strong wooden or fiberboard boxes, with not more than one inside glass packaging not exceeding 1 pint capacity, cushioned with sterile absorbent cotton or other cushioning material which will not react with the contents to generate heat, and with such cushioning material in sufficient quantity to completely absorb the contents of the bottle, are excepted from labeling (except labeling is required for transportation by air) and the specification packaging requirements of this subchapter. In addition, shipments are not subject to Subpart F of Part 172 of this subchapter to Part 174 of this subchapter except § 174.24 and to Part 177 of this subchapter, except § 177.817.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[29 FR 18709, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

Editorial Note: For Federal Register citations affecting § 173.223, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.224 Cumene hydroperoxide, dicumyl peroxide, diisopropylbenzene hydroperoxide, paramenthane hydroperoxide, pinane hydroperoxide, and tertiary butylisopropyl benzene hydroperoxide.

(a) Cumene hydroperoxide of strength not exceeding 96 percent in a non-volatile solvent, dicumyl peroxide of strength not exceeding 50 percent in a nonvolatile solvent, diisopropylbenzene hydroperoxide of strength not exceeding 60 percent in a nonvolatile solvent, paramenthane hydroperoxide of strength not exceeding 60 percent in a non-volatile solvent, and tertiary butylisopropyl benzene hydroperoxide of strength not exceeding 60 percent must be packed in specification containers as follows:

(1) Specification 15A, 15B, 15C, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside glass or earthenware containers, not over 1-gallon each, cushioned with incombustible packing material in sufficient quantity to absorb any leakage.

(2) Spec. 17E (§ 178.116 of this subchapter). Metal drums (single trip), with interiors so treated that they will be resistant to the contents.

(3) Specification 103,[1] 103W, 103A,[1] 103AW, 111A60F1, 111A60W1, 111A100F2, or 111A100W2, (§§ 179.200, 179.201 of this subchapter). Tank cars. Authorized for 90 percent or less cumene hydroperoxide in a nonvolatile solvent, dicumyl peroxide of strength not exceeding 50 percent in a nonvolatile solvent, paramenthane hydroperoxide of strength not exceeding 60 percent in a nonvolatile solvent and diisopropylbenzene hydroperoxide of strength not exceeding 60 percent in a nonvolatile solvent only. Specifications 103,[1] 103W, 111A60F1 and 111A60W1 tank cars must have bottom outlets effectively sealed from the inside.

(4) Specification MC-310, MC-311 or MC-312 (§ 178.343 of this subchapter). Tank motor vehicles. Authorized for diisopropylbenzene hydroperoxide of strength not exceeding 60 percent in a nonvolatile solvent. Bottom outlets are not authorized. Authorized for paramenthane hydroperoxide of strength not exceeding 60 percent in a nonvolatile solvent. Authorized for pinane hydroperoxide of strength not exceeding 45 percent in a nonvolatile solvent. Authorized for cumene hydroperoxide of strength not exceeding 90 percent in a nonvolatile solvent in MC-311 or MC-312 cargo tanks only.

[29 FR 18709, Dec. 29, 1964, as amended by Order 73, 32 FR 3455, Mar. 2, 1967. Redesignated at 32 FR 5606, Apr. 5, 1967]

Editorial Note: For Federal Register citations affecting § 173.224, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.225 Phosphorus trisulfide; phosphorus sesquisulfide; phosphorus heptasulfide, and phosphorus pentasulfide.

(a) Phosphorus trisulfide, phosphorus sesquisulfide and phosphorus heptasulfide must be packaged as follows.

(1) Specification 15A, 15B, or 19B (§§ 178.168, 178.169, 178.191 of this subchapter). Wooden boxes with inside metal containers, hermetically

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[1] Use of existing tank cars authorized, but new construction not authorized.

sealed (soldered) or water-tight metal cans with screw-top closures.

(2) Spec. 6B or 6C (§ 178.98 or § 178.99 of this subchapter). Metal barrels or drums, not over 30 gallons capacity each.

(3) Spec. 37A or 37B (§ 178.131 or § 178.132 of this subchapter). Metal drums (single-trip). Gross weight not over 425 pounds.

(b) Phosphorus pentasulfide must be packed as follows:

(1) In any packaging prescribed in § 173.154 which will not permit water to come in contact with the lading.

(2) Specification 53[1] or 56 (§§ 178.251, 178.252 of this subchapter). Metal portable tank.

(3) Metal drum not over 15 gallons capacity. Authorized only for phosphorus pentasulfide fused into a solid mass before transportation.

[29 FR 18709, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.225, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.227 Urea peroxide.

(a) Urea peroxide must be packed in specification containers as follows:

(1) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes with inside containers which must be rubber or plastic containers not exceeding 4 ounces each. Gross weight not over 65 pounds.

(2) Spec. 21C (§ 178.224 of this subchapter). Fiber drums completely coated on the inside with a suitable wax, synthetic coating, or metal foil suitable to the lading; or fiber drums having a metal foil (laminated between two sheets of kraft paper with thermoplastic adhesive) moisture and water barrier wound into the sidewall of the drum and located not more than 2 plies from the interior of drum but not to be wound as the first ply; a metal foil moisture and water barrier must also be present in the fiber or wood heading; exterior of drum sidewall must be protected with a water resistant coating; in addition to the tests prescribed by § 178.224-2 (a), (b), and (c) of this subchapter, a drum having been given a 4-foot diagonal bottom chime drop must, after being emptied, withstand complete immersion of the bottom in 6 inches of water for 4 hours without leakage to the interior. Authorized net weight not over 225 pounds.

(3) Spec. 22A (§ 178.196 of this subchapter). Plywood drums with paper bags, Spec. 2J (§ 178.28 of this subchapter) coated with suitable wax on the inner surface.

[29 FR 18709, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16073, Apr. 15, 1976]

§ 173.228 Zinc ammonium nitrite.

(a) Zinc ammonium nitrite must be packed in specification containers as follows:

(1) Spec. 6B or 6C (§ 178.98, or § 178.99 of this subchapter). Metal barrels or drums.

(2) Spec. 17E, 17H, 37A, or 37B (§§ 178.116, 178.118, 178.131, or § 178.132 of this subchapter). Metal drums (single-trip). Gross weight not over 300 pounds.

[29 FR 18709, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-14, 45 FR 59891, Sept. 11, 1980]

§ 173.229 Chlorate and borate mixtures or chlorate and magnesium chloride mixtures.

(a) Chlorate and borate mixtures or chlorate and magnesium chloride mixtures containing more than 50 percent chlorate and no other hazardous additives must be packed as follows:

(1) As prescribed in § 173.163.

(b) Limited quantities of chlorate and borate mixtures or chlorate and magnesium chloride mixtures containing no other hazardous additives and containing less than 50 percent chlorate are excepted from labeling (except labeling is required for transportation by air) and the specification packaging requirements of this subchapter. In addition, shipments are not subject to Subpart F of Part 172 of this subchapter, to Part 174 of this subchapter except § 174.24 and to Part 177 of this subchapter except § 177.817.

(1) Tight metal or fiber drums.

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[1] Use of existing tank cars authorized, but new construction not authorized.

(2) Wooden boxes with tight inside metal containers.

(3) Multi-wall paper bags, net weight not over 50 pounds, moisture proof and sift proof, and having a strength capable of withstanding four 4-foot drops onto solid concrete.

(4) Strong fiberboard boxes with inside fiber containers having metal tops and bottoms, net weight not over 4 pounds each; gross weight of completed package not over 65 pounds.

(5) Strong fiberboard boxes with not more than 4 inside paper bags Spec. 2D (§ 178.23 of this subchapter), having net weight not over 10 pounds each.

(c) Chlorate and borate mixtures or chlorate and magnesium chloride mixtures containing 28 percent or less chlorate and no other hazardous additives, are not subject to the regulations in Parts 170-189 and 397 of this title.

[29 FR 18709, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16073, Apr. 15, 1976; Amdt. 173-94A, 41 FR 40681, Sept. 20, 1976]

§ 173.230 Sodium, metallic, dispersion in organic solvent.

(a) Sodium, metallic, dispersion in organic solvent must be packed in specification containers as follows.

(1) Specification 15A, or 19B (§§ 178.168, 178.191 of this subchapter). Wooden boxes with inside containers which must be metal cans not exceeding one quart capacity, and each such can must be packed in another metal can and cushioned on all sides with at least one inch of incombustible dry nonhydroscopic material which is nonreactive with sodium at temperatures encountered during normal transportation. Both the inner and outer metal cans shall be equipped with an airtight closing device secured by positive means (not friction). Gross weight of completed package must not exceed 100 pounds.

(2) Spec. 17H (§ 178.118 of this subchapter). Metal drum (single-trip) of not over 55 gallons capacity, with material contained in an inside spec. 17E (§ 178.116 of this subchapter) metal drum (single-trip) of not over 30 gallons capacity. The inside drum shall be snugly packed in the outside drum by completely and evenly surrounding it with incombustible dry nonhygroscopic material which is nonreactive with sodium at temperatures encountered during normal transportation.

(3) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes constructed of at least 375-pound test (Mullen or Cady) solid fiberboard with inside metal cans not exceeding one quart capacity. Each such can must be packed in another metal can and cushioned on all sides with at least one inch of incombustible dry nonhygroscopic material which is nonreactive with sodium at temperatures encountered in normal transportation. Both the inner and outer metal cans shall be equipped with an airtight closing device secured by positive means (not friction) and must be individually nested into a double-faced corrugated partition of at least 200-pound test (Mullen or Cady) which is in turn surrounded on all sides by a peripheral double-walled corrugated liner of at least 200-pound test (Mullen or Cady). Authorized gross weight not over 90 pounds.

(4) Specification 15A, or 19B (§§ 178.168, 178.191 of this subchapter). Wooden boxes with inside polyethylene bottles not exceeding 1-quart capacity each cushioned on all sides with at least 1-inch soda ash and then placed within an airtight metal can closed by a positive means. Metal cans shall be cushioned so as to prevent movement within the outer box. Solvents used must be compatible with the inner polyethylene bottle. Gross weight of the completed package must not exceed 100 pounds.

(5) Specification 17H (§ 178.118 of this subchapter). Metal drum, with one inside Specification, 5, 5C, 6B, or 6C (§§ 178.80, 178.83, 178.98, 178.99 of this subchapter) closed head metal drum not over 30 gallons capacity. Inside drum must be completely surrounded with incombustible cushioning material.

[29 FR 18709, Dec. 29, 1964, as amended by Order 66, 30 FR 5745, Apr. 23, 1965. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16073, Apr. 15, 1976; Amdt. 173-149, 46 FR 49899, Oct. 8, 1981; Amdt. 173-187, 50 FR 11703, Mar. 25, 1985]

§ 173.231 Calcium, metallic, crystalline.

(a) Calcium, metallic, crystalline must be packed in specification containers as follows:

(1) Specification 15A, 15B, or 19B (§§ 178.168, 178.169, 178.191 of this subchapter). Wooden boxes with inside airtight metal containers not over 1-gallon capacity each.

(2) Spec. 6B or 6C (§§ 178.98, 178.99 of this subchapter). Metal barrels or drums, gross weight not over 350 pounds.

(3) Spec. 17C or 17H (§§ 178.115 or 178.118 of this subchapter). Metal drums (single-trip), gross weight not over 350 pounds.

[29 FR 18709, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5 1967, and amended by Amdt. 173-94, 41 FR 16073, Apr. 15, 1976; Amdt. 173-14, 45 FR 59891, Sept. 11, 1980; Amdt. 173-149, 46 FR 49899, Oct. 8, 1981]

§ 173.232 Aluminum, metallic powder.

(a) Aluminum flake powders which have been rendered nondusting by agglomerating or other treatment of the individual particles, aluminum granules, aluminum atomized powder and aluminum paste are not subject to the requirements of this subchapter.

(b) Limited quantities of metallic aluminum powder, other than the powder described in paragraph (a) of this section in earthenware, glass, metal, or plastic inside packagings of not more than 5 pounds capacity each, in strong outside packaging of not over 25 pounds net weight, is excepted from labeling (except that labeling is required for transportation by air) and the specification packaging requirements of this subchapter. In addition, shipments are not subject to Subpart F of Part 172 of this subchapter, to Part 174 of this subchapter except § 174.24 and to Part 177 of this subchapter, except § 177.817.

(c) Metallic aluminum powder, other than the powder described in paragraph (a) of this section, when not packed in accordance with paragraph (b) of this section, must be packaged as follows:

(1) Steel barrel or drum, not over 650 pounds net weight.

(2) Wooden box, not over 125 pounds gross weight.

(3) Moisture and sift-proof bag, not over 100 pounds net weight.

(4) Fiber drum, not over 650 pounds net weight.

(5) Fiberboard box, not over 650 pounds net weight.

(6) Portable tanks, not over 6,500 pounds gross weight.

(7) In bulk in rail cars and cargo tanks.

[Amdt. 173-94, 41 FR 16073, Apr. 15, 1976, as amended by Amdt. 173-94A, 41 FR 40682, Sept. 20, 1976]

EDITORIAL NOTE: For Federal Register citations affecting § 173.232, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.234 Sodium nitrite and sodium nitrite mixtures.

(a) Sodium nitrite and sodium nitrite mixtures must be packed in specification containers as follows:

(1) In containers as prescribed in § 173.154.

(2) Specification 44C (§ 178.237 of this subchapter). Multiwall paper bags. Each bag must be constructed as follows and, in addition, each bag must have one inner ply bonded or coated with polyethylene or other suitable pliable plastic material having a minimum basis weight of 10 pounds, or an additional polyethylene inner ply (free film) of equivalent moisture barrier properties:

(i) At least 5 plies having a minimum total basis weight of 310 pounds, or at least 4 plies of extensible Kraft paper having a minimum basis weight of 240 pounds. Maximum authorized net weight is 100 pounds; or

(ii) At least 3-plies of extensible Kraft paper having a minimum basis weight of 180 pounds. Maximum authorized net weight is 50 pounds.

(3) Spec. 21C (§ 178.224 of this subchapter). Fiber drums: Authorized net weight not over 400 pounds.

(4) Spec. 37A (§ 178.131 of this subchapter). Metal drums constructed of steel having minimum thickness of 24 gauge. Bolted or lever-lock closure rings authorized provided drums withstand test prescribed by § 178.131-11 of this subchapter. Authorized gross weight not over 425 pounds.

(5) Sodium nitrite is authorized for shipment in tight sift-proof covered hopper cars. Cars must be thoroughly cleaned before loading.

(6) Tank cars which must be thoroughly cleaned before loading.

[29 FR 18709, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16073, Apr. 15, 1976; Amdt. 173-118, 43 FR 31141, July 20, 1978]

§ 173.235 Ammonium bichromate (ammonium dichromate).

(a) Ammonium bichromate (ammonium dichromate) must be packed in specification containers as follows:

(1) In containers as prescribed in § 173.154.

(2) Spec. 21C (§ 178.224 of this subchapter). Fiber drums. Authorized net weight not over 400 pounds.

[29 FR 18709, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16073, Apr. 15, 1976]

§ 173.236 Decaborane.

(a) Decaborane must be packed in specification containers as follows:

(1) Spec. 6B or 6C (§§ 178.98, 178.99 of this subchapter). Metal barrels or drums.

(2) Spec. 17C, 17E, 17H, 37A, or 37B (§§ 178.115, 178.116, 178.118, 178.131, or § 178.132 of this subchapter). Metal drums (single-trip).

(3) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes with inside containers which must be metal cans; sliding-lid wooden boxes; fiber cans or boxes, spec. 2G (§ 178.26 of this subchapter), not over 5 pounds capacity each; or glass bottles not over 1 pound capacity each. Packages containing glass containers must not weigh over 65 pounds gross.

[29 FR 18709, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16073, Apr. 15, 1976; Amdt. 173-14, 45 FR 59891, Sept. 11, 1980]

§ 173.237 Chlorine dioxide hydrate, frozen; chloric acid.

(a) Chlorine dioxide hydrate, frozen, and chloric acid must be packed in specification packaging as follows:

(1) Specification 12B (§ 178.205 of this subchapter). Fiberboard boxes, with inside packages of polyethylene or other suitable material. Fiberboard boxes must be reinforced and insulated and sufficient dry ice must be used to maintain the hydrate or acid in a frozen state during transportation. Shipments are authorized for transportation by private or contract carrier by motor vehicle only.

[Amdt. 173-94, 41 FR 16073, Apr. 15, 1976, as amended by Amdt. 173-138, 45 FR 32696, May 19, 1980]

§ 173.238 [Reserved]

§ 173.239 Barium azide—50 percent or more water wet.

(a) Barium azide—50 percent or more water wet, must be packed in specification containers as follows:

(1) Specification 15A, 15B, 15C, 16A, 19A, 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside glass bottles not over 1-pound capacity each. Bottles shall have rubber stoppers wire tied for securement. If shipment is to take place at a time freezing weather is to be anticipated, a suitable antifreeze solution must be used to prevent freezing.

(2) Specification 21C (§ 178.224 of this subchapter). Fiber drum with inside glass bottle not over 1-pound capacity each. Bottles must have rubber stoppers wire-tied for securement. If shipment is to take place at a time freezing weather is to be anticipated, a suitable antifreeze solution must be used to prevent freezing.

[29 FR 18709, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16074, Apr. 15, 1976; Amdt. 173-107, 42 FR 42207, Aug. 22, 1977; Amdt 173-149, 46 FR 49899, Oct. 8, 1981]

§ 173.239a Ammonium perchlorate.

(a) Ammonium perchlorate must be packed in specification containers as follows:

(1) In containers as prescribed in § 173.154.

(2) Specification 53[1] or 56 (§§ 178.251, 178.252 of this subchapter). Metal portable tank. Lower side or hopper-type product discharge openings are not permitted.

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[1] Use of existing tanks authorized. Construction not authorized after May 31, 1972.

[Order 66, 30 FR 5745, Apr. 23, 1965, as amended by Order 71, 31 FR 9070, July 1, 1966. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.239a, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

Subpart F—Corrosive Materials: Definition and Preparation

§ 173.240 Corrosive material; definition.

(a) For the purpose of this subchapter, a corrosive material is a liquid or solid that causes visible destruction or irreversible alterations in human skin tissue at the site of contact, or in the case of leakage from its packaging, a liquid that has a severe corrosion rate on steel.

(1) A material is considered to be destructive or to cause irreversible alteration in human skin tissue if when tested on the intact skin of the albino rabbit by the technique described in Appendix A to this part, the structure of the tissue at the site of contact is destroyed or changed irreversibly after an exposure period of 4 hours or less.

(2) A liquid is considered to have a severe corrosion rate if its corrosion rate exceeds 0.250 inch per year (IPY) on steel (SAE 1020) at a test temperature of 130° F. An acceptable test is described in NACE Standard TM-01-69.

(b) If human experience or other data indicate that the hazard of a material is greater or less than indicated by the results of the tests specified in paragraph (a) of this section, the Department may revise its classification or make the material subject to the requirements of Parts 170-189 of this subchapter.

[Amdt. 173-61, 37 FR 5947, Mar. 23, 1972; as amended by Amdt. 173-74, 38 FR 20839, Aug. 3, 1973; Amdt. 173-94, 41 FR 16074, Apr. 15, 1976]

§ 173.241 Outage.

(a) The outage (ullage) for packagings containing corrosive liquids, when offered for transportation, must be in accordance with the following requirements:

(1) *General outage requirements.* Packagings must not be completely filled. The proper vacant space (outage) in a tank car or other shipping container depends on the coefficient of expansion of the liquid and the maximum increase of temperature to which it will be subjected in transit. Outage must be calculated to the total capacity of the container.

(2) *Outage requirements for packagings of 110 gallons or less.* Sufficient outage must be provided so that the packaging will not be liquid full at 130° F. (55° C.).

(3) *Outage requirements for tank cars.* In tank cars, outage must be calculated to percentage of the total capacity of the tank, i.e., shell and dome capacity combined. If the dome of the tank car does not provide sufficient outage, then vacant space must be left in the shell to make up the required outage. The outage for tank cars must not be less than 2 percent, except that outage for Specification 103A, 103B, 103C, 103E, 103A-AL, 103C-AL, 103AW, 103BW, 103CW, 103EW, 103ANW, 103A-ALW, tank cars must not be less than 1 percent.

(4) *Outage requirements for cargo tanks or portable tanks.* No cargo tank or portable tank, or compartment thereof, used for the transportation of any corrosive liquid shall be completely filled. The outage for cargo tanks and portable tanks must be no less than 2 percent.

[29 FR 18725, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.241, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.242 Bottles containing corrosive liquids.

(a) Bottles containing corrosive liquids, as defined by § 173.240, may not be packed in the same package with any other hazardous material, except as specifically provided in paragraphs (b) and (c) of this section and §§ 173.25, 173.257, 173.258, 173.259, 173.260, 173.261, or § 173.286.

(b) Bottles containing corrosive liquids cushioned by noncombustible, nonreactive absorbent material and securely packed in tightly closed metal packaging, except hydrofluoric acid which must be overpacked in a packaging other than one made of metal, may be packed with other hazardous materials. This exception does not apply to nitric acid exceeding 40-percent concentration, perchloric acid, hydrogen peroxide exceeding 52-percent strenght by weight, or nitrohydrochloric or nitrohydrochloric acid diluted, which may not be packed in the same package with any other article under any circumstances.

(c) Corrosive liquid solutions in securely closed bottles, in quantities necessary for preparing photographic processing mixtures and efficiently cushioned, may be packed in the same outside shipping container with required amounts of packaged chemicals not classed as hazardous materials by these regulations, provided no dangerous reaction would occur should the contents of bottles be mixed with the packaged chemicals. Marking prescribed in Part 172 of this subchapter is not required.

[Amdt. 173-105, 42 FR 28133, June 2, 1977, and Amdt. 173-118, 43 FR 31141, July 20, 1978]

§ 173.243 Closing and cushioning.

(a) All containers must be tightly and securely closed. Inside containers must be cushioned as prescribed or in any case when necessary to prevent breakage or leakage.

[29 FR 18725, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

§ 173.244 Limited quantities of corrosive materials.

(a) Limited quantities of corrosive materials for which exceptions are permitted as noted by reference to this section in § 172.101 of this subchapter are excepted from labeling (except when offered for transportation by air) and specification packaging requirements when packed according to the following paragraphs. In addition, shipments are not subject to Subpart F of Part 172 of this subchapter, to Part 174 of this subchapter except § 174.24 and to Part 177 of this subchapter except § 177.817.

(1) Corrosive liquids in bottles having a rated capacity not over 16 ounces by volume each enclosed in a metal can packed in strong outside packaging.

(2) Corrosive liquids in metal or plastic containers having a rated capacity not over 16 ounces by volume in strong outside packaging.

(3) Corrosive liquids in glass containers having a rated capacity not over 8 fluid ounces by volume in strong outside packaging and cushioned with sufficient absorbent material to completely absorb the liquid contents in the event of breakage, and which will not react chemically with the corrosive material.

(4) Corrosive solids in earthenware, glass, plastic, or paper containers of not more than 5 pounds capacity each packed in metal, wooden or fiberboard outside packaging not exceeding 25 pounds net weight each.

(5) Corrosive solids in metal, rigid fiber or composition cans or cartons or rigid plastic containers; of not more than 10 pounds capacity each, overpacked in metal, wooden or fiberboard outside containers not exceeding 25 pounds net weight each.

(b) Special exceptions for shipment of certain corrosive materials in the ORM-D class are provided in Subpart N of this part.

[29 FR 18725, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.244, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.245 Corrosive liquids not specifically provided for.

(a) Corrosive liquids, as defined in § 173.240, other than those for which special requirements are prescribed, must be packed in specification containers constructed of materials that will not react dangerously with or be decomposed by the chemical packed therein, as follows:

(1) Specification 1A (§ 178.1 of this subchapter). Glass carboys in boxes. Not authorized for transportation by aircraft.

(2) Spec. 1X (§ 178.5 of this subchapter). Boxed carboys; single-trip for export only. For shipment by common carriers by water to noncontiguous territories or possessions of the United

States and foreign countries; shipments from inland points in the United States which are consigned to such destinations are authorized to be transported to ship side by rail freight in carload lots only and by motor vehicle in truckload lots only.

(3) Specification 1D or 1M (§§ 178.4, 178.17 of this subchapter). Glass carboys in boxes or expanded polystyrene packagings. Pressure in the carboy may not exceed 10 pounds per square inch at 130°F. (55°C.). If the package is vented, there may be no significant release of contents to the environment. Not authorized for transportation by aircraft.

(4) Specification 5A, 5B, 5C, or 5M (§§ 178.81, 178.82, 178.83, 178.90 of this subchapter). Metal barrels or drums.

(5) Specification 5K (§ 178.88 of this subchapter) Nickel barrels or drums. Authorized only for commodities that will not react with nickel and result in container failure.

(6) [Reserved]

(7) Specification 15A, 15B, 15C, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside containers which must be glass, earthenware, polyethylene or other nonfragile plastic material (bags are not authorized), not over 1-gallon each, except that inside containers up to 3 gallons are authorized when only one is packed in each outside container.

(8)–(11) [Reserved]

(12) Specification 12B (§ 178.205 of this subchapter). Fiberboard boxes with inside packagings of metal, polyethylene, or other non-fragile plastic material resistant to the lading, not exceeding 1-gallon each. A metal packaging is authorized only for a material that is not corrosive to metal. Gross weight may not exceed 65 pounds.

(13) Spec. 15P or 22C (§ 178.182 or § 178.198 of this subchapter). Glued plywood or wooden box, or plywood drum as prescribed by § 178.198-2(a) of this subchapter, with Spec. 2T (§ 178.21 of this subchapter) polyethylene container.

(14) Spec. 17C, 17E, or 17F (§§ 178.115, 178.116, or 178.117 of this subchapter). Metal drums (single-trip) with openings not exceeding 2.3 inches in diameter.

(15) Specification 17H (§ 178.118 of this subchapter). Metal drums (single-trip). Authorized only for liquid boiler compounds, liquid water treatment compounds, and viscous cleaning compounds, liquid.

(16) Specification 6D or 37M (non-reusable container) (§§ 178.102, 178.134 of this subchapter). Cylindrical steel overpacks with inside Spec. 2S, 2SL, or 2U (§§ 178.35, 178.35a, 178.24 of this subchapter) polyethylene packaging.

(17) Specification 17H, 37A or 37B (§§ 178.118, 178.131, or 178.132 of this subchapter), metal drums (single-trip), with welded side seams, not over 5 gallons capacity each. Drums must be lined throughout with a pliable plastic material impervious to the lading. Specifications 37A and 37B metal drums must be at least 24 gauge steel. Not authorized for transportation by air.

(18) Specification 12A (§ 178.210 of this subchapter). Fiberboard boxes with inside glass, polyethylene, or other nonfragile plastic bottles not over 5-quart capacity each. Not more than 4 inside glass bottles exceeding 5-pint capacity each shall be packed in the outside container. Shipper must have established that the completed package meets test requirements prescribed by § 178.210-10 of this subchapter.

(19) Specification 37P (§ 178.133 of this subchapter). Steel drum with polyethylene liner (non-reusable container). Authorized only for materials that will not react with polyethylene and result in container failure. Not authorized for transportation by air.

(20) Specification 16D (§ 178.187 of this subchapter). Wirebound wooden overwrap, with inside Specification 2T, 2TL, 2S, or 2SL (§§ 178.21, 178.27, 178.35, 178.35a of this subchapter) polyethylene container. Not authorized for transportation by air.

(21) Specification 12P (§ 178.211 of this subchapter). Fiberboard box with one inside Specification 2U (§ 178.24 of this subchapter) polyethylene container of not over 5-gallon capacity, or two inside Specification 2U polyethylene containers of not over 2½ gallon ca-

pacity each. Wire staples are not authorized for assembly or closure of boxes, except when polyethylene container is completely enclosed in inside boxes free of wire staples or other projections that could cause failures. Not authorized for transportation by air.

(22) Specification 16A (§ 178.185 of this subchapter). Wirebound wooden box (§ 178.185-22 of this subchapter) with inside Specification 2U (§ 178.24 of this subchapter) polyethylene container. The polyethylene container must be separated from the wooden box by a complete corrugated fiberboard liner and top and bottom pads. Not authorized for transportation by air.

(23) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes with inside polyethylene bottles, not over 5 gallons capacity each, as specified by § 178.205-34 of this subchapter. Not more than one bottle shall be packed in one outside box.

(24) Spec. 21P (§ 178.225 of this subchapter). Fiber drum overpack with inside Spec. 2S, 2SL, or 2U (§§ 178.35, 178.35a, or § 178.24 of this subchapter) polyethylene container.

(25) Specification 12A or 12B (§§ 178.210, 178.205 of this subchapter) fiberboard boxes with inside aluminum packagings which must be compatible with the lading.

(26) Specification 34 (§ 178.19 of this subchapter). Polyethylene drum. The shipper shall assure conformance with the requirements of § 173.24(d) of this part prior to first shipment.

(27) Specification 33A (§ 178.150 of this subchapter). Polystyrene case (nonreusable container) with inside glass bottles not over 5-pint capacity each. Not more than four 5-pint bottles may be packed in one outside packaging.

(28) Specification steel or nickel cylinders prescribed for any compressed gas except acetylene are authorized. All cylinder valves must be protected by one of the methods described in § 173.301(g) (1), (2), or (3) of this part. See § 173.34(e)(16).

(29) Specification MC 303 or MC 304. Tank motor vehicle meeting § 178.343-2(c) of this subchapter. Specification MC 303 must have tanks fabricated from 12-gauge, Type 316 stainless steel. MC 303 is authorized only for monoethanolamine; *primary amyl alcohol;* and phosphoric acid and solutions thereof.

(30) Specification MC 307 (§§ 178.340, 178.342 of this subchapter). Tank motor vehicle meeting § 178.343-2(c) of this subchapter.

(31) Specification MC 306, MC 310, MC 311, or MC 312 (§§ 178.340, 178.341, 178.343 of this subchapter). Tank motor vehicles. If cargo tank is constructed with bottom outlets, they must meet § 178.343-5 of this subchapter. Specification MC 306 must have tanks fabricated from 12 gauge, Type 316 stainless steel. MC 306 is authorized only for monoethanolamine, primary amyl alcohol, phosphoric acid and solutions thereof; MC 306 constructed aluminum is authorized only for monoethanolamine *primary amyl alcohol.*

(32) Specification 103AW, 103A-ALW, 103ANW, 103BW, 103CW, 103EW, 105A100W, 105A200ALW, 109A200ALW, 111A100F2, 111A60ALW2, 111A60W2, 111A60W5, or AAR-201A80W (§§ 179.100, 179.101, 179.200, 179.201 of this subchapter). Tank cars. Specification 105A200ALW tank cars authorized only for acetic anhydride and ammonium hydroxide. Specification 105A100W tank cars authorized only for ammonium hydroxide and dimethyl chlorothiophosphate. AAR-201A80W and 109A200ALW tank cars authorized only for ammonium hydroxide.

(33) Specification 103ALW, 103DW, 103W, 104W, 111A60ALW1, 111A60W1, 111A100W3, 111A100W6, 115A60W6, or AAR206W (§§ 179.200, 179.201, 179.220 of this subchapter). Tank cars. (See Note 1.)

NOTE 1: Authorized only on an interim basis pending the Department's decision on use of bottom outlets for tank cars containing hazardous materials.

(34) Specification 42B (§ 178.107 of this subchapter). Aluminum drum.

(35) Marine portable tanks meeting the requirements of 46 CFR Part 64 authorized for highway and cargo vessel only when shipped in support of off-shore oil well drilling activities. Tank must be compatible with lading. Not authorized for corrosive materials

which also meet the definition of another hazard class. Tanks shall comply with mounting and tie-down requirements of § 178.245-4 of this subchapter when transported by highway.

(36) Ammonium hydroxide containing no more than 30 percent ammonia by weight may be transported by motor vehicle in non-specification cargo and portable tanks that meet the requirements of § 173.24.

(37) Specification IM 101 and IM 102 portable tanks (§§ 178.270, 178.271, 178.272 of this subchapter) are authorized under conditions specified in the IM Tank Table.

(38) Specification 57 (§ 178.253 of this subchapter). Steel portable tank. Authorized only for acetic acid, glacial; acetic acid solutions; compound, cleaning liquid; compound, rust preventing *or* compound, rust removing; monoethanolamine; *orthochlorophenol;* paint *or* paint related material; *primary amyl alcohol;* and phosphoric acid not exceeding 85 percent strength. For acid solutions, tanks constructed of a steel other than stainless steel must have a polyethylene liner impervious to the solution. Authorized for transportation by water when having a minimum design pressure of 9 psig and equipped in accordance with § 178.253-4, except that frangible devices are not authorized. Also, for water transportation, no pressure relief device may open at less than 5 psig.

(b) Except when transportation by aircraft or vessel is involved and except for a hazardous waste or a hazardous substance, a material classed as a corrosive material that is corrosive only to steel and does not meet the definition of any other hazard class defined in this subchapter, is excepted from the requirements of this subchapter for rail or highway when transported in a portable tank, cargo tank, or tank car constructed of materials that will not react dangerously with or be degraded by the material being transported. For hazardous wastes and hazardous substances that would otherwise be subject to this paragraph, only the requirements of Parts 171 and 172 of this subchapter apply.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[29 FR 18725, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.245, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.245a Corrosive liquids, n.o.s. shipped in bulk.

(a) Corrosive liquids, n.o.s. which are listed in the following table, may not be shipped in bulk unless they are packaged as follows:

Corrosive liquid	Authorized tank car	Authorized portable tank [3]
Dichlorobutene and Dichlorobutene mixtures.	105A300W, 112A340W	
Ethyl chlorothioliformate		DOT-51 monel or monel-clad.
Ethyl phosphonothioic dichloride, anhydrous.	103AW, 111A60W2	DOT-51.
Ethyl phosphonous dichloride, anhydrous.		DOT-51.
Ethyl phosphorodichloridate [2].	103ANW, 103AW, 111A100F2 111A100W2	
Methyl phosphonothioic, dichloride, anhydrous.	103AW	DOT-51.
Methyl phosphonous dichloride [1].		DOT-51.
Vanadium oxytrichloride and titanium tetrachloride mixture.		DOT-51 monel or monel clad. DOT-51.

[1] In an unlined tank, must be loaded and shipped under a blanket of nonflammable, dry, inert gas, adequate to displace any significant amount of air.

[2] Specification 103ANW tank car tank must be solid nickel at least 95 percent pure; all cast metal parts of the tank in contact with the lading must have a minimum nickel content of approximately 96.7 percent. Specification 103A tank car tanks must be lead-lined steel or must be made of steel at least 10 percent nickel -clad; specification 103AW, 111A100F2, or 111A60W2 tank must be lead-lined steel or made of steel with a minimum thickness of nickel cladding 1/16 inch; nickel cladding in tanks must have a minimum nickel content at least 99 percent pure nickel.

[3] Tank must be equipped with a safety-relief valve set at not less than 100 psig. In addition, the relief valve must comply with § 173.315(i)(1).

(b) Corrosive liquids, n.o.s., except those listed in paragraph (a) of this section, when shipped in bulk, must be packaged as prescribed by § 173.245.

[Amdt. 173-57, 36 FR 21288, Nov. 5, 1971, as amended by Amdt. 173-74, 38 FR 20839, Aug. 3, 1973]

EDITORIAL NOTE: For Federal Register citations affecting § 173.245a, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.245b Corrosive solids not specifically provided for.

(a) Corrosive solids, as defined in § 173.240, other than those for which special requirements are prescribed, must be packaged in containers fully complying with § 173.24, as follows:

(1) Metal, wooden, or fiberboard box or case with inside containers which must be earthenware, glass, metal, plastic, or fiber or composition board of not more than 10 pounds net weight capacity each.

(2) Fiberboard box with inside paper bags, not over 50 pounds total net capacity. When shipped by water, each box must include a moisture barrier.

(3) Fiberboard box with one inside plastic bag of not over 120 pounds net weight capacity.

(4) Metal drum.

(5) Fiber drum not exceeding 550 pounds net weight and not over 65-gallon capacity. When shipped by water, each drum must include a moisture barrier.

(6) Open head plastic drum or pail not exceeding 95 pounds net weight and not over 7-gallon capacity or closed head plastic drum not exceeding 550 pounds net weight and not over 55-gallon capacity.

(7) Bag: Each bag filled to weight with product and closed as for shipment must be capable of withstanding four drops from a height of 4 feet onto a solid surface, one drop on each end and one drop on each face, without sifting or rupture. Authorized net weight not to exceed 110 pounds. When shipped by water, each bag must include a moisture barrier.

(8) Metal portable tank or closed bin not over 7,000 pounds gross weight.

(9) Fiberglass or rubber tank or closed bin of not over 74-cubic-foot capacity.

(10) Metal sift-proof cargo tank or tank car, or hopper-type or pneumatic bulk vehicle.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 173-61, 37 FR 5948, Mar. 23, 1972, as amended by Amdt. 173-74, 38 FR 20839, Aug. 3, 1973]

Editorial Note: For Federal Register citations affecting § 173.245b, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.246 Antimony pentafluoride, bromide pentafluoride, iodine pentafluoride, bromine trifluoride, and chlorine trifluoride.

(a) Antimony pentafluoride must be chemically anhydrous. Materials cited in the heading of this section must be packed in specification packagings as follows:

(1) Specification 3A150, 3AA150, 3B240, 3BN150, 4B240, 4BA240, 4BW240, or 3E1800 (§§ 178.36, 178.37, 178.38, 178.39, 178.50, 178.51, 178.61, 178.42 of this subchapter). Cylinders. Each valve outlet must be sealed by a threaded cap or a threaded plug. Cylinder valves must be protected as specified for corrosive gases in § 173.301(g). No cylinder may be equipped with any safety relief device. Specification 3E1800 cylinders must be packaged in accordance with the requirements of § 173.301(k).

(2) Specification 106A500X or 110A500W (§§ 179.300, 179.301 of this subchapter). Tanks. Authorized for iodine pentafluoride and chlorine trifluoride only. Each tank must be equipped with a valve protection cover and with solid steel plugs in place of fusible plug safety devices. No tank may be equipped with any safety relief device.

(3) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter) are authorized under conditions specified in the IM Tank Table.

[Amdt. 173-81, 39 FR 17318, May 15, 1974, as amended by Amdt. 173-144, 46 FR 9894, Jan. 29, 1981]

§ 173.247 Acetyl bromide; acetyl chloride; acetyl iodide; antimony pentachloride; benzoyl chloride; boron trifluoride acetic acid complex; chromyl chloride; dichloroacetyl chloride; diphenylmethyl bromide solutions; pyrosulfuryl chloride; silicon chloride; sulfur chloride (mono and di); sulfuryl chloride, thionyl chloride; tin tetrachloride (anhydrous); titanium tetrachloride; trimethyl acetyl chloride.

(a) Acetyl bromide, acetyl chloride, acetyl iodide, antimony pentachloride; benzoyl chloride, boron trifluoride-acetic acid complex, chromyl chloride, dichloroacetyl chloride, diphenylmethyl bromide solutions, pyro sulfuryl chloride, silicon chloride, sulfuryl chloride (mono and di), sulfuryl chloride, thionyl chloride, tin tetrachloride (anhydrous), titanium tetrachloride, and trimethyl acetic chloride must be packaged in specification packagings as follows:

(1) Specification 15A, 15B, 15C, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside glass or earthenware containers not over 1-gallon each, except that inside containers up to 3 gallons each are authorized when only one is packed in an outside box.

(2) Specification 6D (§ 178.102 of this subchapter). Cylindrical steel overpack with inside Specification 2S or 2SL (§§ 178.35, 178.35a of this subchapter) polyethylene packaging. Polyethylene used must be Type III as set forth in Appendix B—Specifications for Plastics to Part 178 of this title. Authorized for acetyl chloride, dichloroacetyl chloride, sulfuryl chloride and trimethyl acetyl chloride only.

(3) Specification 1A, 1D, 1K, or 1M (§§ 178.1, 178.4, 178.14, 178.17 of this subchapter). Glass carboys in boxes or expanded polystyrene packagings (not permitted for antimony pentachloride or tin tetrachloride, anhydrous). Not authorized for transportation by aircraft.

(4) Spec. 1X (§ 178.5 of this subchapter). Boxed carboys; single-trip for export only. For shipment by common carriers by water to noncontiguous territories or possessions of the United States and foreign countries; shipments from inland points in the United States which are consigned to such destinations are authorized to be transported to ship side by rail freight in carload lots only and by motor vehicle in truckload lots only (not permitted for antimony pentachloride or tin tetrachloride anhydrous).

(5) Specification 15A, 15B, 15C, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside aluminum bottles of 99 percent pure aluminum not over 1-gallon capacity each, having aluminum screw caps with gasket resistant to contents. Authorized for chromyl chloride only.

(6) Specification 15A, 15B, 15C, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boses with inside containers of securely closed soft-lead tubes having not more than 65 fluid ounces capacity each, individually packed in securely closed steel tubes, with not more than 3 such steel tubes fastened together as a unit. The inside units shall be cushioned on all sides with an appropriate fire-resistant cushioning material. Authorized only for titanium tetrachloride.

(7) Specification 5, 5A, 5B, or 17C (§§ 178.80, 178.81, 178.82, 178.115 of this subchapter). Metal barrels or drums with openings not exceeding 2.3 inches in diameter.

(8) Spec. 5K (§ 178.88 of this subchapter). Nickel drums, authorized for acetyl chloride, benzoyl chloride, pyro sulfuryl chloride, sulfuryl chloride, and thionyl chloride only. When shipped in unstabilized condition, the lading must be anhydrous and must be free from impurities such as iron.

(9) Spec. 5C (§ 178.83 of this subchapter). Barrels or drums of type 304 stainless steel not over 30-gallon capacity each. Authorized for chromyl chloride and thionyl chloride only.

(10) Spec. 42D (§ 178.109 of this subchapter). Aluminum drums not over 30 gallons capacity each. Authorized for chromyl chloride only.

(11) Spec. 60 (§ 178.255 of this subchapter). Portable tanks.

(12) Specification MC 310, MC 311, MC 312, MC 330 or MC 331 (§§ 178.343, 178.337 of this subchapter). Tank motor vehicles. Bottom outlets are authorized if they meet the requirements of § 178.343-5 of this subchapter.

(13) Specification 103A,[1] 103AW, 105A300W, 111A60W2, or 111A100F2 (§§ 179.100, 179.101, 179.200, 179.201 of this subchapter) tank cars, except that for tin tetrachloride (anhydrous) specification 105A300W tank cars must be used.

(14) Specification 103A,[1] 103AW, 111A60W2, or 111A100F2 (§§ 179.200,

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[1] The use of existing tanks authorized but new construction not authorized.

179.201 of this subchapter). Tank cars. Authorized for titanium tetrachloride, anhydrous only. Tank cars must have safety valves of approved design and not subject to rapid deterioration by the lading.

(15) Sulfur chloride packed in glass or earthenware bottles or carboys must be cushioned in the outside container by means of incombustible elastic packing material of such nature that a mixture of the liquid and the packing material will not cause fires or heating.

(16) Specification 106A500X or 110A500W (§§ 179.300, 179.301 of this subchapter) tanks. Authorized only for antimony pentachloride and titanium tetrachloride (anhydrous). Tanks containing titanium tetrachloride (anhydrous) must not be equipped with safety devices. (See § 177.834(m) of this subchapter for special requirements for highway shipments.)

(17) Specification 4BA240 or 4BW240 (§§ 178.51, 178.61 of this subchapter). Cylinders authorized for titanium tetrachloride or tin tetrachloride, anhydrous, without any compressed gas. Specification 4BW carbon steel cylinders authorized for antimony pentachloride. Safety relief devices are authorized only on cylinders containing titanium tetrachloride.

(18) Specification 3E1800 (§ 178.42 of this subchapter). Cylinder authorized only for thionyl chloride, anhydrous and titanium tetrachloride, anhydrous.

(19) Specification 51 (§ 178.245 of this subchapter). Portable tank authorized only for titanium tetrachloride, anhydrous, without any compressed gas.

(20) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter) are authorized under conditions specified in the IM Tank Table.

(21) [Reserved]

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[29 FR 18725, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.247, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.247a Vanadium tetrachloride and vanadium oxytrichloride.

(a) Vanadium tetrachloride and vanadium oxytrichloride must be packed in specification packagings as follows:

(1) Specification 3A, 3AA, 4B240, 4BA240, 4BW240, or 3E1800 (§§ 178.36, 178.37, 178.50, 178.51, 178.61, 178.42 of this subchapter). Cylinders.

(2) Specification 51 (§ 178.245 of this subchapter) portable tanks.

(3) Specification MC 310, MC 311, or MC 312 (§§ 178.340, 178.343 of this subchapter). Tank motor vehicles. Authorized only for vanadium oxytrichloride with an inert non-soluble gas padding, adequate to exclude the presence of air. Specification MC 310 and MC 311 cargo tanks must be in compliance with § 178.343-2 (b) or (c) as applicable, and §§ 178.340-9(a) and 178.343-4(a) of this subchapter. Not authorized for transportation by water. Bottom outlets are authorized if they meet the requirements of § 178.343-5 of this subchapter.

(4) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter) are authorized under conditions specified in the IM Tank Table.

[Amdt. 173-11, 34 FR 12591, Aug. 1, 1969, as amended by Amdt. 173-84, 39 FR 33532, Sept. 18, 1974]

EDITORIAL NOTE: For Federal Register citations affecting § 173.247a, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.248 Spent sulfuric acid, or spent mixed acid.

(a) Spent sulfuric acid, or spent mixed acid, resulting from the use of sulfuric acid in various processes, not containing hydrofluoric acid, must be packaged as follows:

(1) Specification 1A, 1D, or 1M (§§ 178.1, 178.4, 178.17 of this subchapter). Carboys in boxes or expanded polystyrene packagings. Authorized for spent sulfuric acid only. Not authorized for transportation by aircraft.

(2) Spec. 1X (§ 178.5 of this subchapter) Boxed carboys; single-trip for export only. For shipment by common carriers by water to noncontiguous territories or possessions of the United States and foreign countries; shipments from inland points in the

United States which are consigned to such destinations are authorized to be transported to ship side by rail freight in carload lots only and by motor vehicle in truckload lots only.

(3) Specification 15A, 15B, 15C, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside glass or earthenware containers not over 1-gallon each, except that inside containers up to 3 gallons each are authorized when only one is packed in each outside box.

(4) Specification 103A,[1] 103AW, 111A60W2, or 111A100F2 (§§ 179.200 and 179.201 of this subchapter). Tank cars, provided the product is sufficiently liquid to be unloaded through the dome or manway. Tanks which do not contain products or contaminants that give off noxious or flammable vapors may be equipped with safety vents incorporating lead discs having a ⅛-inch breather hole in the center thereof.

(5) Spec. 103,[1] 103-W, 111A60-F-1, or 111A60-W-1 (§§ 179.200 and 179.201 of this subchapter). Tank cars, provided the product is too viscous to be unloaded through the dome or manway. Tanks which do not contain products or contaminants that give off noxious or flammable vapors may be equipped with safety vents incorporating lead discs having a ⅛-inch breather hole in the center thereof.

(6) Specification MC 310, MC 311, or MC 312 (§ 178.343 of this subchapter). Tank motor vehicles. Bottom outlets are authorized if they meet the requirements of § 178.343-5 of this subchapter.

(7) Spec. 60 (§ 178.255 of this subchapter). Portable tanks.

(8) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter) are authorized under conditions specified in the IM Tank Table.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[29 FR 18725, Dec. 29, 1964, as amended by Order 71, 31 FR 9070, July 1, 1966; Order 73, 32 FR 3456, Mar. 2, 1967. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.248, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.249 Alkaline corrosive liquids, n.o.s.; alkaline liquids, n.o.s.; alkaline corrosive battery fluid; potassium fluoride solution; potassium hydrogen fluoride solution; sodium aluminate, liquid; sodium hydroxide solution; potassium hydroxide solution.

(a) Alkaline corrosive liquids, n.o.s.; alkaline liquids, n.o.s.; alkaline corrosive battery fluid; potassium fluoride solution; potassium hydrogen fluoride solution; sodium aluminate, liquid; sodium hydroxide solution and potassium hydroxide solution, when offered for transportation by carriers by rail freight, highway, or water must be packed in specification containers of a design and constructed of materials that will not react dangerously with or be decomposed by the chemical packed therein as follows:

(1) In containers prescribed in § 173.245.

(2) Specification 15A, 15B, 15C, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside glass or earthenware containers not over 2 gallons each, or with metal containers, not over 5 gallons each.

(3) Specification 5 (§ 178.80 of this subchapter) metal drums. Openings must not exceed 2.3 inches in diameter.

(4) [Reserved]

(5) Specification 103,[1] 103W, 103A,[1] 103AW, 103B,[1] 103BW, 104,[1] 104W, 105A100,[1] 105A100W, 111A60F1, 111A60W1, 111A60W2, 111A100F2, 111A60W5, or 111A100W4 (§§ 179.100, 179.101, 179.200, 179.201 of this subchapter). Tank cars.

(6) Specification MC 303, MC 310, MC 311 or MC 312 (§ 178.343 of this subchapter). Tank motor vehicles. Specification MC 303 is authorized for alkaline corrosive liquids, n.o.s., and alkaline liquids, n.o.s. only and is not authorized for transportation by water. Bottom outlets are authorized

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[1] The use of existing tanks authorized but new construction not authorized.

[1] The use of existing tanks authorized but new construction not authorized.

if they meet the requirements of § 178.343-5 of this subchapter.

(7) Specification 57 or 60 (§§ 178.251, 178.253, 178.255 of this subchapter). Portable tanks. Specification 57 portable tank not authorized for transportation by water.

(8) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes with glass inside containers of not over 16 ounces capacity each.

(9) [Reserved]

(10) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes, with not more than one glass inside container not over 1 gallon capacity containing sodium hydroxide solution not over 25 percent strength and packed in a strong fiberboard box. Dry chemicals for photographic development process not classed as dangerous articles, contained in suitable inside packages, may be packed in the same outside box. The marking requirements of § 172.312 of this subchapter, shall not apply.

(11) Spec. 29 (§ 178.226 of this subchapter). Mailing tubes, with not more than one inside polyethylene bottle not over 1-quart capacity each.

(12) Spec. 1H (§ 178.13 of this subchapter). Metal crate with inside polyethylene container Spec. 2T (§ 178.21 of this subchapter).

(13) Specification 12B (§ 178.205 of this subchapter). Fiberboard box with inside metal containers. Not more than four 1-gallon or six 1-quart containers may be packed in each box. Maximum gross weight may not exceed 65 pounds and the completed package must meet the test requirements of § 178.210-10 of this subchapter.

(14) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter) are authorized under conditions specified in the IM Tank Table.

(b) The hazardous materials named in paragraph (a) of this section, when offered for transportation by aircraft, must be packaged as follows (also authorized for transportation by rail freight, highway or water):

(1) In packagings as prescribed in paragraphs (a)(8), (10), and (11) of this section and § 173.245(a)(7) and (12).

(2) Spec. 5 or 5A (§ 178.80 or 178.81 of this subchapter). Metal barrels or drums, capacity not exceeding 10 gallons, with openings not exceeding 2.3 inches in diameter.

(3) Specification 15A, 15B, 15C, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside glass or earthenware containers not over 1-gallon each, or with inside metal cans, not over 5 gallons each.

(c) Limited quantities of alkaline corrosive liquids, n.o.s., alkaline liquids, n.o.s., alkaline corrosive battery fluids, and liquid sodium aluminate in inside packagings of not more than 8 fluid ounces capacity each, packed in strong outside packagings, and cushioned with absorbent material in sufficient quantity to completely absorb liquid contents in the event of breakage, are excepted from labeling (except labeling is required for transportation by air) and specification packaging requirements of this subchapter. In addition, shipments are not subject to Subpart F of Part 172 of this subchapter, to Part 174 of this subchapter except § 174.24 and to Part 177 of this subchapter except § 177.817.

(d) Special exceptions for shipment of certain alkaline in the ORM-D class are provided in Subpart N of this part.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[29 FR 18725, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.249, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.249a Cleaning compound, liquid; coal tar dye, liquid; dye intermediate, liquid; mining reagent, liquid; and textile treating compound mixture, liquid.

(a) A liquid cleaning compound subject to this section must not contain any corrosive material specifically named in § 172.101 of this subchapter, except phosphoric acid, acetic acid, and not over 15 percent sodium or potassium hydroxide.

(b) A liquid dye intermediate is a ring compound, containing amino, hydroxy, sulfonic acid, or quinone group or a combination of these groups, used in the manufacture of dyes, and not otherwise specifically named in § 172.101 of this subchapter.

(c) A liquid textile treating compound mixture is a mixture used to treat woven, knit or otherwise manufactured fabrics. It does not include mixtures used only to treat fibers, filaments, or yarn used in making the fabric.

(d) Liquid coal tar dye, liquid cleaning compound, liquid dye intermediate liquid mining reagent, and liquid textile treating compound mixture must be packaged as follows:

(1) In specification packagings as prescribed in § 173.245.

(2) In packagings meeting all of the specific requirements prescribed in § 173.245 including packaging type and quantity limitations for inside packagings. The packagings are not required to meet the detailed specification requirements of Part 178 of this subchapter except that size and weight limitations for package types as prescribed in Part 178 may not be exceeded. Not authorized for shipment by aircraft.

(3) Removable (open) head fiber drum lined or coated on the inside with a plastic material, not over 55-gallon capacity. Not authorized for shipment by aircraft.

(4) Removable (open) head metal drum, not over 55-gallon capacity. Not authorized for shipment by aircraft.

(5) Removable (open) head polyethylene drum, not over 6.5-gallon capacity. Not authorized for shipment by aircraft.

[Amdt. 173-77, 38 FR 35471, Dec. 28, 1973, as amended by Amdt. 173-121, 43 FR 48644, Oct. 19, 1978]

§ 173.250 Automobiles, other self-propelled vehicles, engines or other mechanical apparatus.

(a) Except as provided in paragraph (b) of this section, automobiles and other self-propelled vehicles equipped with wet electric storage batteries are excepted from all other requirements of this subchapter when shipped as prescribed in paragraph (a)(1) or (2) of this section, unless other hazardous materials are transported on the self-propelled vehicles, in which instance the regulations covering these other materials apply.

(1) When batteries are removed from the self-propelled vehicles and loaded in the transport vehicle therewith, the batteries must be so loaded, blocked and braced as to prevent short circuits, spillage of battery fluid or movement within the transport vehicle.

(2) When batteries are installed in self-propelled vehicles they must be completely protected against short circuits and so secured that spillage of battery fluid will not occur under conditions normal to transportation.

(b) For transportation by passenger-carrying aircraft, wheelchairs equipped with wet electric storage batteries must be shipped as prescribed in § 175.10 of this subchapter.

(c) When wet electric storage batteries or batteries packed in containers with battery fluid are shipped as part of carload or truckload shipments of automobile parts or assembly materials, they are subject to no other requirements of this subchapter when the batteries and battery fluid are boxed or crated and so loaded, blocked and braced as to prevent short circuits of the batteries, spillage of battery fluid and movement of the materials in the transport vehicle under conditions normal to transportation. When other hazardous materials are included in the shipments, the regulations covering these other materials apply.

(d) Engines or mechanical apparatus of such size or weight as to require securement to skids to facilitate handling may have electric storage batteries, wet, necessary for the operation thereof, either securely fastened in the holder provided on the equipment and protected, including battery terminals, in such manner as to prevent damage thereto or short circuits, or completely boxed in containers of sound lumber and with filling holes upright, securely fastened to the skids upon which the engine or mechanical apparatus is mounted to prevent accidental tipping or looseness in transportation. Electric storage batteries, wet, as described herein are exempt from specification packaging.

[29 FR 18725, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16075, Apr. 15, 1976;

Amdt. 173-94A, 41 FR 40682, Sept. 20, 1976; Amdt. 173-15, 47 FR 24586, June 7, 1982; Amdt. 173-160, 48 FR 54822, Dec. 6, 1983]

§ 173.250a Benzene phosphorus dichloride and benzene phosphorus thiodichloride.

(a) Benzene phosphorus dichloride and benzene phosphorus thiodichloride must be packaged as follows:

(1) In packagings prescribed in § 173.245 which are made of or lined with materials compatible with the lading.

(2) Spec. MC 310, MC 311, or MC 312 (§ 178.343 of this subchapter) cargo tanks. Corrosion protection must be provided in accordance with spec. MC 312. Bottom outlets are authorized if they meet the requirements of § 178.343-5 of this subchapter.

(3) Spec. 103AW (§§ 179.200 and 179.201 of this subchapter) tank cars. Tanks must be lined.

(4) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter) are authorized under conditions specified in the IM Tank Table.

[Amdt. 173-8, 34 FR 9868, June 26, 1969, as amended by Amdt. 173-133, 44 FR 60101, Oct. 18, 1979]

EDITORIAL NOTE: For Federal Register citations affecting § 173.250a, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.251 Boron trichloride and boron tribromide.

(a) Boron trichloride must be packed in specification containers as follows:

(1) Specification steel or nickel cylinders as prescribed for any compressed gas except acetylene.

(2) Specification 105A300W or 106A500X (§§ 179.100, 179.101, 179.300, 179.301 of this subchapter). Tank cars.

(b) Boron tribromide must be packed in specification packagings as follows:

(1) Specification 15A, 15B, 15P, or 19B (§§ 178.168, 178.169, 178.170, 178.182, 178.191 of this subchapter). Wooden or plywood boxes with inside glass receptacles not over 1 quart capacity each. Each glass receptacle must have a positive closure (not friction) and as prepared for shipment must be capable of withstanding an internal gage pressure of at least 15 p.s.i. The receptacle must be cushioned with sufficient absorbent incombustible material to completely absorb the contents in the event of leakage and must be packed within a securely closed metal can. Each can must then be cushioned with incombustible material within the prescribed outside packaging. Completed packaging for shipment must be capable of passing the tests prescribed in § 178.182-3(a)(1) of this subchapter.

(2) Specification 5C or 5M (§§ 178.83, 178.90 of this subchapter). Metal drums not exceeding 30 gallons capacity. Specification 5C drums must be constructed of at least 14-gauge stainless steel.

(3) Specification 37A (§ 178.131 of this subchapter). Steel drums not over 30-gallon capacity each with inside glass receptacles not over 1-quart capacity each. Inside containers and cushioning must comply with paragraph (b)(1) of this section. Not more than four 8-ounce glass receptacles or two 1-quart glass receptacles may be packed within one 8-gallon 37A drum. Not more than twelve 8-ounce glass receptacles or six 1-quart glass receptacles may be packed within one 30-gallon 37A drum. Completed package must meet test requirements of § 178.131-11 of this subchapter.

[29 FR 18725, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register amendments affecting § 173.251, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.252 Bromine.

(a) Bromine must be packed in specification containers as follows:

(1) Specification 15A, 15B, or 19B (§§ 178.168, 178.169, 178.191 of this subchapter). Wooden boxes with inside glass containers not over 1-quart each; or with stone or earthenware jugs not over 1-gallon each.

(2) [Reserved]

(3) Specification 105A300W (§§ 179.100, 179.101 of this subchapter). Tank car. Each tank must have a nickel cladding material on the inside surface comprising at least 20 percent of the total thickness, or be lined with lead no less than $\frac{3}{16}$-inch thick. Openings in tank heads to facilitate applica-

tion of lead lining are authorized and must be closed in an approved manner. All closures and appurtenances which are in contact with the lading must be lead lined or must be made of metal not subject to rapid deterioration by contact with the lading. All interior welds in nickel clad tanks must be protected by pure nickel butt straps. Except as otherwise provided herein, the water weight capacity of the tank must not be more than 20,400 pounds, and the maximum quantity of liquid bromine loaded into the tank must not be more than 60,000 pounds or 300 percent of the water weight capacity of the tank, whichever quantity is less. The total quantity loaded must not be less than 98 percent of the quantity the tank is authorized to carry.

(i) A tank constructed and maintained in full compliance with the requirements of a Specification DOT-105A500W is authorized for larger capacities of bromine. However, this tank may be marked DOT-105A300W and may be equipped with manway cover plates, safety valves, venting valves, loading valves, and unloading valves that are in compliance with the requirements of a Specification DOT-105A300W tank. The water weight capacity of this tank must not be more than 37,400 pounds, and the maximum quantity of liquid bromine loaded into the tank must not be more than 110,000 pounds or 300 percent of the water weight capacity of the tank, whichever quantity is less.

(ii) Each tank car must be marked "BROMINE" in accordance with the requirements of § 172.330 of this subchapter.

(4) Specification MC 310 or MC 312 (§ 178.343 of this subchapter). Tank motor vehicles. Each tank must have a shell and head thickness of at least ⅜-inch. Each tank must have a nickel cladding material on the inside surface comprising at least 20 percent of the total thickness or be lined with lead at least 3/16-inch thick. The cladding material must conform to requirements of ASTM Specification B-162-69. The composite plate must conform to requirements of ASTM Specification A-265-69. The maximum quantity of liquid bromine loaded into the tank must not exceed 300 percent of the water weight capacity of the tank. The total quantity loaded must not be less than 92 percent of the quantity the tank is authorized to carry. Bottom outlets are authorized if they meet the requirements of § 178.343-5 of this subchapter.

(5) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter), under conditions specified in the IM Tank Table. In addition, each tank must have a nickel cladding material on the inside surface comprising at least 20 percent of the total thickness or must be lined with lead at least 5.0 mm thick. The cladding material must conform to requirements of ASTM Specification B-162-69. The composite plate must confirm to requirements of ASTM Specification A-265-69. The total quantity in one tank may not be less than 88 percent nor more than 92 percent of the quantity the tank is authorized to carry.

(b) Outage (vacant space above liquid) for inside containers must be not less than 15 percent of capacity of container.

(c) For other authorized containers an outage of not less than 10 percent is required.

(d) Inside containers must be closed by glass, earthenware, or stone stoppers ground to fit and securely fastened; or bottles may have necks with molded screw threads which must be closed by threaded-type caps with lead or other efficient bromine-resistant gaskets and cushioned by elastic material to insure tight closure. Sealed glass ampoules are also authorized.

(e) Except as provided in paragraphs (g) (2) and (3) of this section, bottles or jugs must be securely cushioned on all sides with incombustible packaging material, such as whiting, mineral wool, infusorial earth (kieselguhr), sifted ashes, powdered china clay, or similar material, at least 1 inch thick, which will not produce heat when mixed with bromine. The use of hay, sawdust, excelsior, or other organic material, either treated or untreated, as a cushioning or packaging material is prohibited.

(f) Not more than 15 quarts of bromine in bottles, nor more than 12 quarts in jugs, may be packed in one box.

(g) Bromine which has been dried in accordance with good commercial practice may also be packed in specification containers as follows:

(1) Specification 5K (§ 178.88 of this subchapter) nickel drums, of not over 10 gallons capacity each, and containing not more than 225 pounds net weight of bromine, or Specification 5M (§ 178.90 of this subchapter) monel drums, of not over 25 gallons capacity each, and containing not more than 600 pounds net weight of bromine. Drums must be at least 14-gauge throughout and must have chime reinforcement adequate for their protection. All openings must be in one head and the closing parts (plug, cap, flange, etc.) must be of the same metal as the drum. One opening not over 2.3 inches in diameter and one opening not over ¾-inch standard pipe size are permitted. Each drum must be completely emptied and dried before reuse.

(2) Specification 12A (§ 178.210 of this subchapter). Fiberboard boxes, constructed of at least 275 pound test (Mullen or Cady) double-wall corrugated fiberboard having not more than six inside glass bottles of not over 1 quart capacity. Each inside glass bottle must be surrounded by a sheet of polyethylene foam at least 7/16 inch thick (see Note 1), and approximately the same height as the bottle, and must also be separated by partitions made of corrugated fiberboard at least 275-pound test (Mullen or Cady). The box must be provided with inside top and bottom pads of polyethylene foam at least 1⅛ inches thick (see Note 1). Shipper must have established that the completed package closed as for shipment, with inside packagings filled with liquid of same specific gravity as bromine, is capable of withstanding tests prescribed by § 178.210-10 of this subchapter. Not authorized for transportation by air.

NOTE 1: Other materials of equal efficiency and compatibility are also authorized.

(3) Specification 12A (§ 178.210 of this subchapter). Fiberboard box with inside glass bottles having a capacity not exceeding one quart with closures meeting the requirements of paragraph (d) of this section. Each bottle must be enclosed in a strong metal can surrounded with an appropriate fire-resistant cushioning material. Each box may not contain more than four bottles with each having a capacity not exceeding 1 quart or 12 bottles with each having a capacity not exceeding 8 fluid ounces. The shipper must have established that the completed package closed for shipment, with inside bottles filled with a liquid of the same specific gravity and similar viscosity as bromine, is capable of withstanding the tests prescribed in § 178.210-10 of this subchapter. Not authorized for transportation by air.

(4) Specification 33A (§ 178.150 of this subchapter). Polystyrene case (nonreusable container) having not more than four inside glass jugs of not over 80 fluid ounces (2.5 liters) each. The polystyrene case must be further overpacked in a strong fiberboard box of at least 275-pound test and adequately cushioned. Not authorized for transportation by aircraft.

(5) Specification 15A (§ 178.168 of this subchapter). Wooden boxes (having an authorized gross weight of not less than 100 pounds) having not more than four inside glass jugs of not over 80 fluid ounces (2.5 liters) each. Jugs must be cushioned with an appropriate absorbent material. Not authorized for transportation by aircraft.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[29 FR 18725, Dec. 29, 1964, as amended by Order 66, 30 FR 5745, Apr. 23, 1965; Order 73, 32 FR 3456, Mar. 2, 1967. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.252, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.253 Chloroacetyl chloride.

(a) Chloracetyl chloride must be packed in specification containers as follows:

(1) Specification 15A, 15B, or 19B (§§ 178.168, 178.169, 178.191 of this subchapter). Wooden boxes with inside glass containers not over 5 pints capacity each; cushioned by an appropriate fire-resistant cushioning material.

(2) Spec. 1M (§ 178.17 of this subchapter). Glass carboys in expanded

polystyrene packagings. Not authorized for transportation by aircraft.

(3)—(4) [Reserved]

(5) Spec. 5K (§ 178.88 of this subchapter). Nickel drums.

(6) Specification MC 310, MC 311, or MC 312 (§ 178.343 of this subchapter). Tank motor vehicles having tanks fabricated from Type 316 stainless steel or 99 percent pure nickel. Bottom outlets are authorized if they meet the requirements of § 178.343-5 of this subchapter.

(7) Specification 103AW, 111A60W2, or 111A100F2 (§§ 179.200, 179.201 of this subchapter). Tank cars. Tanks must have a nickel cladding of 1/16-inch minimum thickness. Nickel cladding in tanks must have a minimum nickel content of at least 99 percent pure nickel.

(8) Spec. 103A-N-W (§§ 179.200 and 179.201 of this subchapter). Tank cars. Tank must be of solid nickel at least 99 percent pure and all cast metal parts of the tank in contact with the lading must have a minimum nickel content of approximately 96.7 percent.

(9) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter) are authorized under conditions specified in the IM Tank Table.

[29 FR 18725, Dec. 29, 1964, as amended by Order 73, 32 FR 3456, Mar. 2, 1967. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.253, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.254 Chlorosulfonic acid and mixtures of chlorosulfonic acid-sulfur trioxide.

(a) Chlorosulfonic acid and mixtures of chlorosulfonic acid-sulfur trioxide must be packed in specification containers as follows:

(1) Spec. 5A or 5C (§§ 178.81 or 178.83 of this subchapter). Metal barrels or drums.

(2) Specification 15A, 15B, 15C, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside glass or earthenware containers not over 1-gallon each, except that inside containers up to 3 gallons are authorized when only one is packed in each outside box.

(3) [Reserved]

(4) Specification 103A,[1] 103AW, 103 CW, 103EW, 111A60W2, 111A60W7, or 111A100F2 (§§ 179.200, 179.201 of this subchapter). Tank cars.

(5) Specification MC 310, MC 311, or MC 312 (§ 178.343 of this subchapter). Tank motor vehicles. Bottom outlets are authorized if they meet the requirements of § 178.343-5 of this subchapter.

(6) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter) are authorized under conditions specified in the IM Tank Table.

[29 FR 18725, Dec. 29, 1964, as amended by Order 73, 32 FR 3456, Mar. 2, 1967. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.254, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.255 Dimethyl sulfate.

(a) Dimethyl sulfate must be packed in specification containers as follows:

(1) Spec. 5A or 5C (§§ 178.81 or 178.83 of this subchapter). Metal barrels or drums not over 55 gallons each. Spec. 5C metal barrels or drums must be constructed of Type 304 stainless steel.

(2) Spec. 5 (§ 178.80 of this subchapter). Metal barrels or drums not over 15 gallons each, with openings not exceeding 2.3 inches in diameter, inclosed in strong crates made of lumber at least 5/8 inch thick.

(3) Specification 15A, 15B, 15C, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with one inside glass container not over 1-quart capacity, closed by ground glass stopper or other eqully efficient closure securely fastened in place, and cushioned within a hermetically sealed (soldered) metal can with an appropriate fire-resistant absorbent, cushioning material, the can then being cushioned with an appropriate fire-resistant cushioning material in the outside box.

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[1] Use of existing tank cars authorized, but new construction not authorized.

(4) Spec. 103A,[1] 103A-W, 111A100-F-2, or 111A100-W-2 (§§ 179.200, 179.201 of this subchapter). Tank cars.

(5) Specification MC 310, MC 311, or MC 312 (§ 178.343 of this subchapter). Tank motor vehicles. Bottom outlets are authorized if they meet the requirements of § 178.343-5 of this subchapter.

(6) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes with each box containing not more than six inside glass containers not over 1-quart capacity each, closed by plastic screw-cap resistant to the lading, and each completely surrounded by incombustible absorbent cushioning material and enclosed in a metal can having rolled, seamed-on heads of a key-opening type; or in not more than six inside glass containers not over 1-quart capacity each, closed by ground glass stopper, by plastic screwcap resistant to the lading, or by other equally efficient closure securely fastened in place, and cushioned with incombustible absorbent material in hermetically sealed (soldered) metal can, the can then being cushioned with incombustible cushioning material in the outside container.

(7) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter) are authorized under conditions specified in the IM Tank Table.

[29 FR 18725, Dec. 29, 1964, as amended by Order 73, 32 FR 3456, Mar. 2, 1967. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.255, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.256 Compounds, cleaning, liquid.

(a) Compounds, cleaning, liquid, containing not more than 60 percent hydrofluoric acid, must be packed in specification containers as follows:

(1) As prescribed in § 173.264(a) (1) and (2).

(2) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes with inside containers of natural rubber, ceresine, lead, or other material of equal strength and not subject to destruction by the lading.

(3) Specification 22B (§ 178.197 of this subchapter) plywood drums equipped with a liner of rubber, polyethylene or other material impervious to the solution.

(4) Spec. 16A (§ 178.185 of this subchapter). Wirebound wooden box (§ 178.185-22 of this subchapter) with inside Specification 2U (§ 178.24 of this subchapter) polyethylene container. The polyethylene container must be separated from the wooden box by a complete corrugated fiberboard liner and top and bottom pads. Not authorized for transportation by air.

(5) Spec. 6D or 21P (§ 178.102 or § 178.225 of this subchapter). Cylindrical steel overpack or fiber drum overpack with inside Spec. 2U (§ 178.24 of this subchapter) polyethylene container not over 15-gallons capacity.

(6) Spec. 37M (§ 178.134 of this subchapter) (nonreuseable). Cylindrical steel overpack with inside Specifications 2SL (§ 178.35a of this subchapter) polyethylene container. Maximum net weight shall not exceed 490 pounds. Authorized only for compounds containing not more than 30 percent hydrofluoric acid.

(7) Spec. 37M (§ 178.134 of this subchapter). Cylindrical steel overpack with inside Specification 2U (§ 178.24 of this subchapter) polyethylene container. For compounds containing not more than 7 percent hydrofluoric acid by weight, the steel overpack must be a minimum of 22-gauge. For compounds containing more than 7 percent hydrofluoric acid by weight but not over 14 percent hydrofluoric acid by weight, the steel overpack must be a minimum of 20-gauge body and 18-gauge heads. When a full removable head is used, the bolted type ring closure must be a minimum of 16-gauge.

(8) Specification 12P (§ 178.211 of this subchapter). Fiberboard boxes with one inside Specification 2U (§ 178.24 of this subchapter) polyethylene container of not over 5-gallon capacity or two inside Specification 2U polyethylene containers of not over 2½ gallon capacity each. Wire staples are not authorized for assembly or closure of boxes, except when polyethylene container is completely enclosed in inside boxes free of wire staples or other projections that could cause fail-

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[1] Use of existing tank cars authorized, but new construction not authorized.

ures. Not authorized for transportation by air.

(9) Specification 34 (§ 178.19 of this subchapter). Polyethylene drum. The shipper shall assure conformance with the requirements of § 173.24(d) of this part prior to first shipment.

(b) Compounds, cleaning, liquid containing not more than 20 percent hydrofluoric acid, by weight, may also be shipped in specification containers as follows:

(1) Specification 57 (§ 178.253 of this subchapter). Steel portable tank. Authorized for transportation by water when having a minimum design pressure of 9 psig and equipped in accordance with § 178.253-4, except that frangible devices are not authorized. Also, for water transportation, no pressure relief device may open at less than 5 psig. Tanks must have a polyethylene liner impervious to the solution.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[29 FR 18725, Dec. 29, 1964, as amended by Order 71, 31 FR 9070, July 1, 1966. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.256, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.257 Electrolyte (acid) and alkaline corrosive battery fluid.

(a) Electrolyte (acid) may not be over 47 percent strength (39° Baume). Electrolyte or alkaline corrosive battery fluid must be packaged as follows (packaging utilizing a bag to contain the electrolyte or battery fluid is not authorized for transportation by air):

(1) As prescribed in § 173.272 except that unlined tank cars and metal barrels or drums must not be used.

(2) [Reserved]

(3) When the material is alkaline it may also be shipped when packed in containers as prescribed in § 173.249.

(4) Specification MC 310, MC 311, or MC 312 (§ 178.343 of this subchapter). Cargo tanks must be lined with rubber or equally acid-resistant material of equivalent strength and durability. Bottom outlets are authorized if they meet the requirements of § 178.343-5 of this subchapter.

(5) Spec. 60 (§ 178.255 of this subchapter). Portable tanks, except that unlined tanks must not be used.

(6) Spec. 12B or 12C (§ 178.205 or § 178.206 of this subchapter). Fiberboard boxes with inside containers of polyethylene or other electrolyte acid resistant nonfragile materials having secure closures capable of withstanding conditions incident to transportation without leakage and unless containers are rigid or semi-rigid in nature they must be contained in other strong inside containers; minimum thickness of polyethylene or other materials shall be not less than 0.003 inch for any film sheet for multi-wall containers or not less than 0.006 inch for single-wall containers; not more than 12 such inside containers shall be packed in one outside box and the marking prescribed in § 172.312 shall not be required. Inside containers shall be packed to prevent movement within the box (see §§ 178.205-34 and 178.206-19 of this subchapter). Dry storage batteries or battery charger device may be packed in the same outside box when adequately separated from other inside containers (see § 178.205-33 of this subchapter); gross weight of completed package shall not exceed 65 pounds, except when acid is packed in individual inside containers the gross weight shall be not over 75 pounds. Complete package, closed as for shipment, with inside containers filled with liquid of same specific gravity as commodity to be shipped, must be capable of withstanding at least 2 drops from a height of 4 feet onto solid concrete without leakage from or rupture of inside containers.

(7) Specification 15A, 15B, 15C, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside polyethylene or other electrolyte acid resistant plastic containers, not over 1-gallon each.

(8) Specification 1EX (§ 178.6 of this subchapter). Carboys in plywood drums. Not authorized for transportation by air.

(9) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes constructed of at least 275-pound test (Mullen or Cady) double-wall corrugated fiberboard or 325-pound test (Mullen or

Cady) doublefaced corrugated fiberboard, with not more than 12 inside glass bottles, having acid-proof closures, of not over 32 ounces capacity each. Inside glass bottles must be separated and cushioned by suitable corrugated fiberboard partitions. The box must be equipped with top and bottom pads. (See § 178.205-32 of this subchapter.)

(10) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes having not more than 1 inside glass bottle, with acid-proof closure, not over 1 gallon capacity. Box shall be constructed of at least 350-pound test (Mullen or Cady) doublefaced corrugated fiberboard of full depth telescope type. Cushioning and closure of box (pressure sensitive tape may be used) must be such that a representative box, with inside glass bottle filled with water, shall be capable of withstanding two drops from a height of 4 feet onto solid concrete without breakage of inner bottle or failure of the closure.

(11) Spec. 12A (§ 178.210 of this subchapter). Fiberboard boxes with inside glass bottles not over 1 gallon capacity each. Not more than 4 inside containers exceeding 5 pints capacity each shall be packed in the outside container. Shipper must have established that the completed package meets test requirements prescribed by § 178.210-10 of this subchapter.

(12) Specification 37P (§ 178.133 of this subchapter). Steel drums with polyethylene liner (non-reusable container). Not authorized for transportation by air.

(13) Specification 34 (§ 178.19 of this subchapter). Polyethylene drum.

(14) Spec. 12B (§ 178.205 of this subchapter). Corrugated fiberboard boxes with plastic bags as defined in § 178.205-37 of this subchapter. Marking prescribed in § 172.312 of this subchapter shall not be required.

(b) Shipments of electrolyte (acid) or corrosive battery fluid with vehicles or engine driven equipment offered for transportation by, for, or to the Departments of the Army, Navy, or Air Force of the U.S. Government are exempt from Parts 171-179 and 397 of this title when packed as follows:

(1) In one inside glass or polyethylene bottle of not over 1-gallon capacity, tightly and securely closed in a strong outside container. Inside glass bottle shall be cushioned therein on all sides with incombustible absorbent material in sufficient quantity to absorb liquid contents in event of breakage. When shipped within or on a motor vehicle or with engines or other mechanical apparatus the outside container must be so blocked, braced, or stayed that it cannot change position during transit.

(c) Electrolyte acid or corrosive battery fluid contained in polyethylene containers not over 2 quarts capacity each and packaged not more than three containers in Specification 15A, 15B, 15C, 16A, 19A, or 19B wooden box (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter), or packaged as prescribed in paragraph (a)(6) of this section, and bearing a corrosive label, may be securely attached to self-propelled vehicles or mobile agricultural machinery, or securely braced on a railcar floor.

(d) Strong, tightly closed metal drums not over 15 gallons capacity each, having not to exceed 25 eight-ounce polyethylene, or other suitable plastic bottles, securely cushioned therein. Shipments authorized only by, for, or to the Departments of the Army, Navy, or Air Force of the United States Government. The drum containing the electrolyte acid or corrosive battery fluid may be securely attached to another steel drum containing a dry, charged storage battery or batteries.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[29 FR 18725, Dec. 29, 1964, as amended by Order 66, 30 FR 5745, Apr. 23, 1965; Order 73, 32 FR 3456, Mar. 2, 1967. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.257, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.258 Electrolyte, acid, or alkaline corrosive battery fluid, packed with storage batteries.

(a) Electrolyte, acid, or alkaline corrosive battery fluid, packed with storage batteries, except as provided in

§ 173.257(a)(6), must be packed in specification containers as follows:

(1) Spec. 15D or 16B (§ 178.171 or § 178.186 of this subchapter). Wooden boxes with inside containers of glass bottles not over 1 gallon each nor over 2 gallons total in each outside container. Inside containers must be well cushioned and separated from batteries by a strong solid wooden partition.

(2) Electrolyte, acid, or alkaline corrosive battery fluid included with storage batteries and filling kits may be packed in strong plywood or wooden boxes when shipments are made by, for, or to the Departments of the Army, Navy, or Air Force of the United States Government in outside containers of their specifications provided the electrolyte, acid, or alkaline corrosive battery fluid is packed in polyethylene bottles not over 32-ounce capacity each and not more than 24 bottles securely separated from storage batteries and kits may be shipped in one outside package.

(3) Specification 12B (§ 178.205 of this subchapter). Fiberboard boxes with not more than 12 inside packagings of polyethylene or other material resistant to the lading, not over 64-ounce capacity each. Polyethylene packagings that are not rigid or semi-rigid in nature must be contained in other strong inside packagings; minimum thickness of polyethylene or other plastic material may be not less than 0.003-inch for any film sheet for multi-wall packagings or not less than 0.006-inch for single-wall packagings. Inside packagings must be adequately separated from the storage battery. Authorized gross weight not over 65 pounds. (See § 178.205-33 of this subchapter.) Not authorized for transportation by air.

[29 FR 18725, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16076, Apr. 15, 1976; Amdt. 173-142, 45 FR 81572, Dec. 11, 1980]

§ 173.259 Electrolyte, acid, or alkaline corrosive battery fluid, packed with battery charger, radio current supply device, or electronic equipment and actuating devices.

(a) Electrolyte, acid, or alkaline corrosive battery fluid packed with battery charger, radio current supply device or parts thereof, or electronic equipment and actuating devices, with only one device or outfit in each package, in the amount necessary for operation of the device or equipment, provided the containers of electrolyte, acid, or alkaline corrosive battery fluid, are adequately cushioned to prevent breakage, leakage, or damage to other articles packed therewith, must be packed in specification containers or as otherwise authorized herein, as follows:

(1) Specification 15A, 15B, 15C, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes, provided the liquid is in bottles securely closed and cushioned as prescribed in paragraph (a) of this section, and separated from charger supply device, and parts, or electronic equipment, by a strong solid wooden partition.

(2) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes, when the liquid is in a strong bottle not exceeding 16 fluid ounces, which must be securely closed and cushioned as prescribed in paragraph (a) of this section. Not more than 12 such packages may be packed under the provisions of § 173.25.

(3) Electrolyte, acid, or alkaline corrosive battery fluid, in separate inside acid or alkaline fluid resistant containers not over 5 gallons capacity each included with electronic equipment and actuating devices, are authorized in strong, tightly closed steel drums.

[29 FR 18725, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16076, Apr. 15, 1976; Amdt. 173-149, 46 FR 49900, Oct. 8, 1981]

§ 173.260 Electric storage batteries, wet.

(a) Electric storage batteries, containing electrolyte acid or alkaline corrosive battery fluid, must be completely protected so that short circuits will be prevented; they must not be packed with other articles except as provided in §§ 173.250 and 173.258, portable searchlights properly cushioned, battery parts, or hydrometers, securely packed in a separate container. The batteries either with or without other articles must be packed in specification containers as follows:

(1) Spec. 15D or 16B (§ 178.171 or § 178.186 of this subchapter). Wooden or wirebound wooden boxes except as provided in paragraphs (b) and (c) of this section.

(2) Spec. 12B (§ 178.205 of this subchapter). Fiberboard box as authorized by §§ 178.205-25(a), 178.205-28(a), and 178.205-35(a) of this subchapter.

(3) Electric storage batteries with case of asphaltum composition, impregnated rubber, steel case type, synthetic resin (plastic), or wooden battery box type, protected against short circuits and firmly secured to skids or pallets capable of withstanding the shocks normally incident to transportation, are exempt from specification packaging requirements for transportation by rail freight, highway, or water. The height of the completed unit must not exceed 1½ times the width of the skid or pallet. The unit must weigh not less than 300 pounds gross and must not fail under a superimposed weight equal to two times the weight of the unit or a superimposed weight of 4,000 pounds if the weight of the unit exceeds 2,000 pounds. Battery terminals must not be relied upon to support any part of the superimposed weight.

(4) Electric storage batteries weighing 500 pounds or more, with case of asphaltum composition, impregnated rubber, steel case type, synthetic resin (plastic), or wooden battery box type, consisting of carriers' equipment may be shipped by rail freight when mounted on suitable skids and protected against short circuits. Such shipments must not be offered in interchange.

(b) Electric storage batteries with case of asphaltum composition, impregnated rubber, steel case type, synthetic resin (plastic), or wooden battery box type; packing authorized as follows:

(1) One to three batteries not over 25 pounds each in outside box, gross weight not over 75 pounds; specification container not required.

(2) Not more than four batteries not over 15 pounds each may be packed in strong outside fiberboard or wooden boxes, when securely cushioned and packed to prevent short circuits; specification container not required. Authorized gross weight 65 pounds.

(3) Not more than five batteries not over 10 pounds each may be packed in strong outside fiberboard or wooden boxes, when securely cushioned and packed to prevent short circuits; specification container not required. Authorized gross weight 65 pounds.

(c) Single batteries not exceeding 75 pounds each, in addition to requirements of paragraphs (a) and (b) of this section, may be shipped in 5-sided slip covers or in completely closed fiberboard boxes, of solid or double-faced corrugated fiberboard complying with the following: (See paragraph (a)(1) of this section for more than one battery in an outside container.)

(1) Slip cover or fiberboard box must fit snugly and provide inside top clearance of at least ½ inch above battery terminals and filler caps with reinforcement in place. Assembled for shipment, the bottom edges of the slip cover may extend to the base of the battery but must not expose more than 1 inch thereof.

(2) Top of slip cover or fiberboard box design must comply with the following:

(i) Top of slip cover or fiberboard box must have interior reinforcement (insert or saddle) of fiberboard, wood, or other material of equal strength and rigidity so formed that any superimposed weight will bear only and directly downward on the top edges of the battery case or intercell connectors (straps), or plastic battery terminal covers designed to transmit any superimposed weight directly to the top inner wall of the battery case, or fiberboard boxes with chip board and chip board jute lined tubes which shall fit directly over the terminal posts and rest directly on battery cell covers.

(ii) Or be protected by a scored one piece cover-liner of 200-pound test (Mullen or Cady) double-faced corrugated fiberboard extending from the base of the battery on one side, across the top of the battery and to the base of the battery on the opposite side.

(iii) Or a five-sided slip cover having top of only one thickness of fiberboard, with lengthwise inner flaps roll folded to form a reinforcement of such height as to provide clearance required by paragraph (c)(1) of this section which shall rest on the side edges of the battery. Outer end flaps to overlap approximately one inch and shall be butt folded and tucked into a center slot cut in the inner flaps. The requirements of paragraphs (c)(2) (i) and (iv) of this section do not apply.

(iv) When top of slip cover or fiberboard box consists of only one thickness of material, reinforcement must have a plane surface of same interior dimensions and thickness. Reinforcement must be of such height as to provide minimum clearance required above and must be constructed to remain securely in place or be fastened to slip cover or fiberboard box.

(3) All fiberboard must be at least 200 pound test (Mullen) and completed package (battery and slip cover or fiberboard box) must be capable of withstanding top-to-bottom compression test of at least 500 pounds without damage to battery terminals, battery cell covers, and filler caps.

(d) Nonspillable wet electric storage batteries capable of withstanding the tests prescribed in paragraphs (d) (1) and (2) of this section without leakage of battery fluid are excepted from all other requirements of this subchapter when protected against short circuits and securely packaged so as to withstand conditions normal to transportation.

(1) *Vibration test.* Battery is rigidly clamped to the platform of a vibration machine and a simple harmonic motion having an amplitude of 0.03 inches (0.06 inches maximum total excursion) is applied. The frequency is varied at the rate of one cycle per second per minute between the limits of 10 to 55 cycles per second. The entire range of frequencies and return is traversed in 95± minutes for each mounting position (direction of vibrator) of the battery. The battery must be tested in three mutually perpendicular positions (to include testing with fill openings and vents, if any, in an inverted position) for equal time periods.

(2) *Pressure differential test.* Following the vibration test, the battery is stored for six hours at 75°F. ± 7°F. under an external partial pressure of 2 pounds per square inch absolute. The battery must be tested in three mutually perpendicular positions (to include testing with fill openings and vents, if any, in an inverted position) for at least six hours in each position.

(e) Electric storage batteries containing electrolyte or corrosive battery fluid are not subject to the requirements of this subchapter for carriage by highway or rail if:

(1) No other hazardous materials are transported in the same vehicle,

(2) The batteries are loaded or braced so as to prevent damage and short circuits in transit,

(3) Any other material loaded in the same vehicle is blocked, braced, or otherwise secured to prevent contact with or damage to the batteries, and

(4) The transport vehicle is carrying no material shipped by any person other than the shipper of the batteries.

(f) Electric storage batteries containing electrolyte or corrosive battery fluid, other than those of the nonspillable type, when shipped in less-than-carload and less-than-truckload lots, must be marked and labeled as prescribed in Part 172 of this subchapter.

(g) Electric storage batteries, containing electrolyte or corrosive battery fluid in a coil from which it is injected into the battery cells by a gas generator and initiator assembled with the battery, and which are nonspillable and leakproof, are excepted from Parts 170-189 of this title when examined by the Bureau of Explosives and approved by the Director, OHMT.

[29 FR 18725, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.260, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.261 Fire-extinguisher charges.

(a) Fire-extinguisher charges consisting of sulfuric acid in glass inside containers securely closed may be packed with bicarbonate of soda in specification containers as follows:

(1) Specification 15A, 15B, 15C, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside glass containers not over 5 pints

each, and cushioned with an appropriate cushioning material.

(2) Spec. 21C (§ 178.224 of this subchapter). Fiber drums with a single inside container consisting of a glass bottle not over 64 fluid ounces capacity filled with not over six pounds by weight of sulfuric acid (approximately 50 fluid ounces by volume). Bottle must be suspended in center of outside container by means of adequate supports and surrounded by bicarbonate of soda in sufficient quantity to fill drum and neutralize contents in the event of breakage

(b) Limited quantities of fire-extinguisher charges as described in paragraphs (b) (1) through (3) of this section are excepted from labeling (except labeling is required for transportation by air) and the specification packaging requirements. In addition, shipments are not subject to Subpart F of Part 172 of this subchapter, to Part 174 of this subchapter except § 174.24 and to Part 177 of this subchapter, except § 177.817.

(1) Fire-extinguisher charges consisting of sulfuric acid in strong 8-fluid ounce or smaller bottles, securely closed and packed with bicarbonate of soda completely surrounding the bottles of acid in outside fiberboard or wooden boxes. Closure must consist of a metal cap lined with an acid-resistant washer or a composition stopper of material that will not be attacked by the acid.

(2) Fire-extinguisher charges, consisting of chlorosulfonic acid in a hermetically sealed bottle not exceeding 2 ounces capacity, securely packed in a metal container inclosed in another metal container, the inner metal container being cushioned in the outer metal container with an appropriate fire-resistant cushioning material and the completed package embedded in potassium carbonate in outside fiberboard or wooden boxes.

(3) Fire-extinguisher charges, consisting of sulfuric acid in 10-ounce or smaller bottles, securely closed, packed in a tight fiber carton. Closure must consist of a metal cap lined with an acid-resistant washer or a composition stopper of material that will not be attacked by the acid. The bottle and carton packed in either potassium carbonate or potassium carbonate and alkali packed in a cylindrical tin can, with slip cover, secured by tape in outside fiberboard or wooden boxes

[29 FR 18725, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16076, Apr. 15, 1976; Amdt. 173-94A, 41 FR 40682, Sept. 20, 1976; Amdt. 173-141, 45 FR 63082, Sept. 18, 1980; Amdt. 173-149, 46 FR 49900, Oct. 8, 1981]

§ 173.262 Hydrobromic acid.

(a) Hydrobromic acid not over 49 percent strength must be packed in specification containers as follows:

(1) Specification 1A, 1D, or 1M (§§ 178.1, 178.4, 178.17 of this subchapter). Carboys in boxes or expanded polystyrene packagings. Not authorized for transportation by aircraft.

(2) Spec. 1X (§ 178.5 of this subchapter). Boxed carboys; single-trip for export only. For shipment by common carriers by water to noncontiguous territories or possessions of the United States and foreign countries; shipments from inland points in the United States which are consigned to such destinations are authorized to be transported to ship side by rail freight in carload lots only and by motor vehicle in truckload lots only.

(3) [Reserved]

(4) Specification 15A, 15B, 15C, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside glass or earthenware containers not over 1-gallon each, except that inside containers not over 3 gallons are authorized when only one is packed in each outside box.

(5) Specification 34 (§ 178.19 of this subchapter). Polyethylene drum. The shipper shall assure conformance with the requirements of § 173.24(d) of this part prior to first shipment.

(6) Specification 103B,[1] 103BW, or 111A60W5 (§§ 179.200, 179.201 of this subchapter). Tank cars.

(7) Spec. 12A (§ 178.210 of this subchapter). Fiberboard boxes with inside glass bottles not over 5 pints capacity each. Not more than six 5-pint glass

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[1] The use of existing tanks authorized but new construction not authorized.

bottles may be packed in one outside container.

Shipper must have established that the completed package meets test requirements prescribed by § 178.210-10 of this subchapter.

(8) Specification 37P (§ 178.133 of this subchapter). Steel drum, not over 5 gallons capacity, with polyethylene liner (non-reusable container). A drum exceeding 1 gallon capacity must be constructed of at least 24 gauge metal. Not authorized for transportation by air.

(9) Spec. 22C (§ 178.198 of this subchapter). Plywood drum as prescribed by § 178.198-2(a) of this subchapter, with inside Spec. 2T (§ 178.21 of this subchapter) polyethylene container.

(10) Spec. 6D (§ 178.102 of this subchapter). Cylindrical steel overpack with inside Spec. 2S (§ 178.35 of this subchapter) polyethylene container.

(11) Specification MC 310, MC 311, or MC 312 (§ 178.343 of this subchapter). Cargo tanks must be lined with rubber or equally acid-resistant material of equivalent strength and durability. Bottom outlets are authorized if they meet the requirements of § 178.343-5 of this subchapter.

(12) Specification 37M (§ 178.134 of this subchapter) (non-reuseable) cylindrical steel overpack with inside Specification 2SL (§ 178.35a of this subchapter) polyethylene container. Overpack must have rolled hoops and be constructed of 20-gauge body and 18-gauge head.

(13) In IM portable tanks as prescribed in paragraph (b)(5) of this section.

(b) Hydrobromic acid greater than 49 percent strength but not over 63 percent strength must be packed in specification containers as follows:

(1) Spec. 22C (§ 178.198 of this subchapter). Plywood drum as prescribed by § 178.198-2(a) of this subchapter, with Spec. 2T (§ 178.21 of this subchapter) polyethylene container.

(2) Specification 6D (§ 178.102 of this subchapter). Cylindrical steel overpack with inside Specification 2S or 2SL (§§ 178.35, 178.35a of this subchapter) polyethylene container.

(3) Specification 15A or 19B (§§ 178.168, 178.191 of this subchapter). Wooden boxes with one inside polyethylene bottle, with screw-up closure, not over 1-gallon capacity.

(4) Specification MC 310, MC 311, or MC 312 (§ 178.343 of this subchapter). Cargo tanks must be lined with rubber or equally acid-resistent material of equivalent strength and durability. Bottom outlets are authorized if they meet the requirements of § 178.353-5 of this subchapter.

(5) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter), under conditions specified in the IM Tank Table.

(6) Specification 12A (178.210 of this subchapter). Fiberboard box with not more than four inside glass bottles not over one-quart capacity each, or 12 inside glass bottles not over eight fluid ounces each. Each bottle must be enclosed in a metal can and surrounded by a noncombustible cushioning material. Box shall be constructed of at least 275-pound test (Mullen or Cady) corrugated fiberboard.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[29 FR 18725, Dec. 29, 1964, as amended by Order 73, 32 FR 3456, Mar. 2, 1967. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.262, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.263 Hydrochloric (muriatic) acid; hydrochloric (muriatic) acid mixtures; hydrochloric (muriatic) acid solution, inhibited; sodium chlorite solution (not exceeding 42 percent sodium chlorite); and cleaning compounds, liquids, containing hydrochloric (muriatic) acid.

(a) Hydrochloric (muriatic) acid, hydrochloric (muriatic) acid mixtures, hydrochloric (muriatic) acid solution, inhibited, sodium chlorite solution not exceeding 42 percent sodium chlorite, and cleaning compounds, liquid, containing hydrochloric (muriatic) acid must be packed in specification containers as follows:

(1) Specification 15A, 15B, 15C, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside glass, earthenware, polyethylene or other nonfragile plastic containers resistant to the lading (bags

are not authorized), not over 1-gallon each, except that inside containers not over 3 gallons each are authorized when only one is packed in each outside box.

(2)—(4) [Reserved]

(5) Specification 1A or 1K (§§ 178.1, 178.14 of this subchapter). Carboys in boxes. Not authorized for transportation by aircraft.

(6) Spec. 1X (§ 178.5 of this subchapter). Boxed carboys; single-trip for export only. For shipment by common carriers by water to noncontiguous territories or possessions of the United States and foreign countries; shipments from inland points in the United States which are consigned to such destinations are authorized to be transported to ship side by rail freight in carload lots only and by motor vehicle in truckload lots only.

(7) Specification 1D, 1EX, (single-trip), or 1M (§§ 178.4, 178.6, 178.17 of this subchapter). Glass carboys in boxes, plywood drums, or expanded polystyrene packagings. Pressure in the carboy may not exceed 10 pounds per square inch gauge at 130°F. (55°C.). If the package is vented, there may be no significant release of contents to the environment. Not authorized for transportation by aircraft.

(8) Specification 57 (§ 178.253 of this subchapter). Steel portable tank. Authorized only for cleaning compounds, liquid, containing hydrochloric (muriatic) acid of not over 20 percent total acid by weight. Tank must have a polyethylene liner impervious to the solution. Authorized for transportation by water when having a minimum design pressure of 9 psig and equipped in accordance with § 178.253-4, except that frangible devices are not authorized. Also, for water transportation, no pressure relief device may open at less than 5 psig.

(9) Specification 103B,[1] 103BW, or 111A60W5 (§§ 179.200, 179.201 of this subchapter) tank cars. These cars are authorized for acid not over 38 percent strength by weight. A safety relief valve or a safety vent of approved design equipped with frangible disc having ⅛-inch breather hole in center thereof or a safety vent of approved design equipped with carbon discs permitting continuous venting may be used, but may not be used for hydrochloric (muriatic) acid of 22° Baume strength or greater, and other fuming acids.

(10) Specification MC 310, MC 311, or MC 312 (§ 178.343 of this subchapter). Tank motor vehicle lined with rubber or equally acid-resistant material of equivalent strength and durability. An unlined specification MC 311 or MC 312 tank motor vehicle made from Type 304L or 316 stainless steel is authorized for sodium chlorite solutions not exceeding 42 percent sodium chlorite only. Bottom outlets are authorized if they meet the requirements of § 178.343-5 of this subchapter.

(11) Spec. 60 (§ 178.255 of this subchapter). Portable tanks, rubber-lined.

(12) Specification 103CW, 111A60W7 (§§ 179.200 and 179.201 of this subchapter). Tank cars having tanks of type 304L stainless steel. Authorized for sodium chlorite solution not exceeding 42 percent sodium chlorite only.

(13) Spec. 1H, 15P, or 22C (§§ 178.13, 178.182, or 178.198 of this subchapter). Metal crate with inside polyethylene carboy; or glued plywood or wooden box, or plywood drum as prescribed by § 178.198-2(a) of this subchapter, with inside Spec. 2T or Spec. 2TL (§ 178.21 or § 178.27 of this subchapter) polyethylene container.

(14) Specifications 17H, 37A, or 37B (§§ 178.118, 178.131, 178.132, of this subchapter). Metal drums (single-trip) not over 5 gallons capacity each. Authorized only for 15 percent or less, inhibited hydrochloric (muriatic) acid solution. Drums must be lined throughout with a pliable plastic material impervious to the solution. Specifications 37A and 37B metal drums must be at least 24 gauge steel. Not authorized for transportation by air.

(15) Specification 12A or 12B (§§ 178.210, 178.205 of this subchapter). Fiberboard boxes with inside containers of polyethylene, or other nonfragile plastic material resistant to the lading (bags are not authorized), not over 1-gallon capacity each, or not more than one of 3-gallon capacity,

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[1] The use of existing tanks authorized but new construction not authorized.

suitably cushioned to prevent movement within the box. Gross weight of completed package must not exceed 65 pounds.

(16) Spec. 12A (§ 178.210 of this subchapter). Fiberboard boxes with inside glass bottles not over 5 pints capacity each. Not more than six 5-pint glass bottles may be packed in one outside container. Shipper must have established that the completed package meets test requirements prescribed by § 178.210-10 of this subchapter.

(17) Specification 6D or 37M (nonreusable container) (§§ 178.102, 178.134 of this subchapter). Cylindrical steel overpacks with inside Specifications 2S, 2SL, 2T, 2TL, or 2U (§§ 178.35, 178.35a, 178.21, 178.27, 178.24 of this subchapter) polyethylene container.

(18) Specification 37P (§ 178.133 of this subchapter). Steel drums constructed of at least 24-gauge metal for drums exceeding 1 gallon capacity, with polyethylene liner (nonreusable container). Not authorized for transportation by air.

(19) Spec. 16D (§ 178.187 of this subchapter). Wirebound wooden overwrap, with inside Spec. 2T, 2TL, 2S, or 2SL (§§ 178.21, 178.27, 178.35, or § 178.35a of this subchapter) polyethylene container.

(20) [Reserved]

(21) Spec. 12C (§ 178.206 of this subchapter). Fiberboard boxes with inside 5-gallon nominal capacity polyethylene bottles having minimum wall thickness of 0.015 inch and constructed with screw-type closures. Authorized gross weight not over 65 pounds. (See § 178.206-19 of this subchapter.)

(22) Spec. 21P (§ 178.225 of this subchapter). Fiber drum overpack with inside Spec. 2T, 2S, 2SL, or 2U (§§ 178.21, 178.35, 178.35a, or § 178.24 of this subchapter) polyethylene container.

(23) Specification 12P (§ 178.211 of this subchapter). Fiberboard box with one inside Specification 2U (§ 178.24 of this subchapter) polyethylene container of not over 5-gallon capacity, each or two inside Specification 2U polyethylene containers of not over 2½ gallon capacity each. Wire staples are not authorized for assembly or closure of boxes, except when polyethylene container is completely enclosed in inside boxes free of wire staples or other projections that could cause failure. Not authorized for transportation by air.

(24) Specification 16A (§ 178.185 of this subchapter). Wirebound wooden box (§ 178.185-22 of this subchapter) with inside Specification 2U (§ 178.24 of this subchapter) polyethylene container. The polyethylene container must be separated from the wooden box by a complete corrugated fiberboard liner and top and bottom pads. Not authorized for transportation by air.

(25) Spec. 22C (§ 178.198 of this subchapter). Plywood drum as prescribed by § 178.198-2(b), with inside Spec. 2TL (§ 178.27 of this subchapter) polyethylene container not over 5 gallon nominal capacity.

(26) Spec. 33A (§ 178.150 of this subchapter). Polystyrene cases (nonreusable container) with inside glass bottles not over 5 pints capacity each. Not more than four 5-pint bottles may be packed in one outside container.

(27) Specification 12R (§ 178.212 of this subchapter). Paper-faced expanded polystyrene board box with not more than six inside glass bottles or Specification 2E (§ 178.24a of this subchapter) inside polyethylene bottles, not over 5 pints capacity each.

(28) Specification 34 (§ 178.19 of this subchapter). Polyethylene drum.

(29) Specification 12R (§ 178.212 of this subchapter). Paper-faced expanded polystyrene board box with not more than four specification 2E (§ 178.24a of this subchapter) inside polyethylene bottles, not over 1-gallon capacity each.

(30) Marine portable tanks meeting the requirements of 46 CFR Part 64 authorized for highway and cargo vessel only when shipped in support of off-shore oil well drilling activities. Tanks shall comply with mounting and tie-down requirements of § 178.245-4 of this subchapter. Authorized only for mixtures of hydrochloric and hydrofluoric acid containing 2% or less of hydrofluoric acid.

(31) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter) are authorized under conditions specified in the IM Tank Table.

(b) Hydrochloric acid of not over 20 percent strength (13.25° Baume 1) and other corrosive liquids containing not over 20 percent hydrochloric acid in addition to containers prescribed in paragraph (a) of this section may be shipped in specification containers as follows:

(1) [Reserved]

(2) Limited quantities of these materials in inside packaging of not more than 8 fluid ounces capacity each, packed in strong outside packagings, and cushioned with absorbent material in sufficient quantity to completely absorb liquid contents in the event of breakage, are excepted from labeling (except labeling is required for transportation by air) and the specification packaging requirements of this subchapter. In addition, shipments are not subject to Subpart F of Part 172 of this subchapter, to Part 174 of this subchapter except § 174.24 and to Part 177 of this subchapter, except § 177.817.

(c) When hydrochloric acid contains oils or solvents it must not be shipped in containers or tank cars lined with rubber.

(d) Hydrochloric acid mixtures of not over 28 percent strength, or cleaning compounds, liquid, containing not over 28 percent hydrochloric (muriatic) acid, in addition to the provisions of paragraphs (a) and (b) of this section, may be packed in specification containers as follows:

(1) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes constructed of at least 275-pound test (Mullen or Cady) double-wall corrugated fiberboard or 325-pound test (Mullen or Cady) double-faced corrugated fiberboard, with not more than 12 inside glass bottles, having acid-proof closures, of not over 32 ounces capacity each. Inside glass bottles must be separated and cushioned by suitable corrugated fiberboard partitions. The box must be equipped with top and bottom pads. (See § 178.205-32 of this subchapter.)

(2) Spec. 12A (§ 178.210 of this subchapter). Fiberboard boxes with inside glass bottles not over 1 gallon capacity each. Not more than 4 inside containers exceeding 5 pints capacity each shall be in the outside container. Shipper must have established that the completed package meets test requirements prescribed by § 178.210-10 of this subchapter.

(e) Special exceptions for the shipment of certain dilute hydrochloric acid solutions in the ORM-D class are provided in Subpart N of this part.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[29 FR 18725, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.263, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.264 Hydrofluoric acid; white acid.

(a) Hydrofluoric acid and white acid (ammonium bifluoride and hydrochloric acid mixture), each must be packed in specification packaging as follows:

(1) Specification 15A, 15B, 15C, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside containers which are hydrofluoric acid resistant. These containers are authorized only for strengths of acid for which they are adequate, but in no case may the strength of acid exceed 70 percent.

(2) Specification 12B (§ 178.205 of this subchapter). Fiberboard boxes with Specification 2E (§ 178.24a of this subchapter) inside polyethylene bottles or inside receptacles of not over 1 pound capacity each, made of natural rubber, lead, or other hydrofluoric resistant plastic. Authorized only for acid not over 70 percent in strength.

(3) Spec. 16D (§ 178.187 of this subchapter). Wirebound wooden overwrap, with inside Spec. 2T (§ 178.21 of this subchapter) polyethylene container. Authorized for hydrofluoric acid not over 70 percent strength.

(4) Specification 12A or 12B (§§ 178.210, 178.205 of this subchapter). Fiberboard boxes with not more than four Specification 2E (§ 178.24a of this subchapter) inside polyethylene bottles, having a minimum thickness of 0.030 inch and not over 1 gallon (nominal) capacity each. Bottle closures must be made secure by sealing with pressure-sensitive plastic tape or other equally efficient means. Au-

thorized for acid not over 70 percent strength. Authorized gross weight for Specification 12B fiberboard boxes not over 65 pounds; Specification 12A not over 80 pounds.

(5)—(7) [Reserved]

(8) Specification 103AW, 105A100W, 111A100F2, 111A60W2, 111A100W4 (§§ 179.100, 179.101, 179.200, 179.201 of this subchapter). Unlined metal tanks which have been subjected to adequate passivity or neutralization process. Each metal container, before being put into service must be passivated by an efficient method. Authorized only for hydrofluoric acid of 60 to 80 percent strength. If tanks are washed out with water they must be resubjected to passivity before reshipment.

(i) Hydrofluoric acid solutions and concentrations of 60 percent up to 65 percent when shipped in unlined metal tank cars must be inhibited so that the corrosive effect on steel must not be greater than that of hydrofluoric acid of 65 percent concentration.

(ii) Each tank car must be marked "HYDROFLUORIC ACID" in accordance with the requirements of § 172.330 of this subchapter.

(9)—(10) [Reserved]

(11) Specification 103BW, 111A100W4, or 111A60W5 (§§ 179.200, 179.201 of this subchapter). Tank cars, rubber-lined tanks. Authorized only for acid not over 40 percent strength except Specification 111A100W4 tanks are authorized only for acid of 70 percent strength.

(12)—(13) [Reserved]

(14) Specification MC 310, MC 311, or MC 312 (§ 178.343 of this subchapter). Tank motor vehicles.

NOTE 1: Hydrofluoric acid solutions and concentrations of 60 percent up to 65 percent, when shipped in unlined tank motor vehicles, must be inhibited so that the corrosive effect on steel must not be greater than that of hydrofluoric acid of 65 percent concentration.

(15) [Reserved]

(16) Spec. 15P or 22C (§§ 178.182 or 178.198 of this subchapter). Glued plywood or wooden box, or plywood drum as prescribed by § 178.198-2(a) of this subchapter, with inside Spec. 2T (§ 178.21 of this subchapter) polyethylene container. Authorized for acid not over 70 percent strength.

(17) Specification 6D (§ 178.102 of this subchapter) or 37M (nonreuseable) (§ 178.134 of this subchapter) cylindrical steel overpacks with inside Specifications 2S, 2SL, or 2T (§§ 178.35, 178.35a, 178.21 of this subchapter) polyethylene liners. Specification 37M overpack of over 15-gallon capacity must be constructed of at least 20-gauge steel. Authorized only for acid of not over 70 percent strength.

(18) Specification 34 (§ 178.19 of this subchapter). Polyethylene drum. Authorized only for hydroflouric acid not over 52% strength.

(19) Specification 12P (§ 178.211 of this subchapter). Fiberboard boxes with one inside Specification 2U (§ 178.24 of this subchapter) polyethylene container of not over 5-gallon capacity or two inside Specification 2U polyethylene containers of not over 2½-gallon capacity each. Authorized only for acid of 48 to 52 percent.

(20) Marine portable tanks meeting the requirements of 46 CFR Part 64 authorized for highway and cargo vessel only when shipped in support of off-shore oil well drilling activities. Tanks shall comply with mounting and tie-down requirements of § 178.245-4 of this subchapter when transported by highway. Authorized for hydrofluoric acid mixtures only.

(21) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter) are authorized under conditions specified in the IM Tank Table.

(b) Hydrofluoric acid, anhydrous (hydrogen fluoride) must be shipped in specification containers as follows:

(1) Specification 3[1], 3A, 3AA, 3B, 3C, 3E, 4, 4A, 25[1], or 38[1] (§§ 178.36, 178.37, 178.38, 178.40, 178.42, 178.48, 178.49 of this subchapter); also Specification 4B, 4BA, 4BW or 4C (§§ 178.50, 178.51, 178.61, 178.52, of this subchapter) if not brazed. Cylinders. Filling density must not exceed 85 percent of the pounds water weight capacity of the cylinder. Cylinders used exclusively in this service may, in lieu of the periodic hydrostatic retest required by § 173.34(e), be given a complete external visual inspection at the time such periodic retest becomes due. Such in-

spections shall be made only by competent persons and shall be made on cylinders cleaned to bare metal and results recorded on a suitable data sheet, completed copies of which shall be kept as prescribed in § 173.34(e)(5). Points to be checked and recorded on these data sheets are: Date of inspection (month and year; DOT specification number; cylinder identification (registered symbol and serial number, date of manufacture, and if needed for adequate identification, ownership symbol); tare weight; physical condition (record specifically, if present; leakage, corrosion, gouges, dents or digs in shell or heads, broken or damaged footring or protective ring or fire damage); disposition of cylinders (returned to service, to cylinder manufacturer for repairs, or scrapped). A cylinder which passes the inspection prescribed shall have the data recorded in the manner presently prescribed for the recording of the retest date except that an "E" is to follow the date (month and year) indicating requalification by the external inspection method. Cylinders removed from this service for any reason must be rendered unfit for any other regulatory service (see § 173.28(1)).

(2) Specification 105A300W, 112A400W, 114A400W, or ARA-V[1] (§§ 179.100, 179.101 of this subchapter). Tank cars equipped with special valves and appurtenances approved for this particular service. Filling density must not exceed 90 percent of the pounds water weight capacity of the tank. For Specification 114A400W tanks, valves and fittings must be located on top of the tank. Bottom openings in tank prohibited.

(i) Each tank car must be marked "HYDROGEN FLUORIDE" in accordance with the requirements of § 172.330 of this subchapter.

(3) Specification MC 310, MC 311, or MC 312 (§ 178.343 of this subchapter). Tank motor vehicles.

(4) Spec. 51 (§ 178.245 of this subchapter). Portable tanks

(5) [Reserved]

(6) Specification 106A500X or 110A500W (§§ 179.300, 179.301 of this subchapter) tanks. Tanks may not be equipped with safety devices of any type and valves must be protected by metal caps. Tanks may not be filled to a density in excess of 85 percent of the water weight capacity of the tank. (See § 177.834(m) of this subchapter for special requirements for highway shipments.)

(c) Containers must not be entirely filled. Unless otherwise provided in this part, sufficient outage (vacant space) must be allowed so that the liquid portion will not completely fill the container at 130° F. in order to prevent leakage or distortion of containers due to the expansion of the contents from increase in temperature during transit.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[29 FR 18725, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.264, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.265 Fluosilicic acid (hydrofluorosilicic acid) (hydrofluosilicic acid).

(a) Fluosilicic acid (hydrofluorosilicic acid) (hydrofluosilicic acid) must be packed in specification containers as follows:

(1) Specification 15A, 15B, 15C, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside containers of natural rubber, ceresine, or other material of equal efficiency resistant to fluosilicic acid (hydrofluorosilicic acid) (hydrofluosilicic acid).

(2)—(3) [Reserved]

(4) Specification 16A (§ 178.185 of this subchapter). Wirebound wooden box (§ 178.185-22 of this subchapter) with inside Specification 2U (§ 178.24 of this subchapter) polyethylene container. The polyethylene container must be separated from the wooden box by a complete corrugated fiberboard liner and top and bottom pads. Not authorized for transportation by air.

(5) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this sub-

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[1] Use of existing tank cars authorized, but new construction not authorized.

chapter) are authorized under conditions specified in the IM Tank Table.

(b) Fluosilicic acid (hydrofluorosilicic acid) (hydrofluosilicic acid) of not exceeding 40 percent strength may also be shipped when packed in specification containers as follows:

(1)—(2) [Reserved]

(3) Specification 103B,[1] 103BW, 111A60W5, or 111A100W2 (§ 179.200, 179.201 of this subchapter). Tank cars, rubber-lined or elastomer lined tanks.

(4) Specification MC 310, MC 311, or MC 312 (§ 178.343 of this subchapter). Cargo tanks must be lined with rubber or equally acid-resistant material of equivalent strength and durability. Bottom outlets are authorized if they meet the requirements of § 178.343-5 of this subchapter.

(c) Fluosilicic acid (hydrofluorosilicic acid) (hydrofluosilicic acid) containing no free hydrofluoric acid or other ingredient that will attack glass, may also be shipped when packed in specification containers as follows:

(1) Specification 1A, 1D, or 1M (§§ 178.1, 178.4, 178.17 of this subchapter). Carboys in boxes or expanded polystyrene packagings. Use of a rubber stopper and gasket is authorized for Specification 1A and 1D carboys only. Not authorized for transportation by aircraft.

(2) Spec. 1X (§ 178.5 of this subchapter). Boxed carboys; single-trip for export only. For shipment by common carriers by water to noncontiguous territories or possessions of the United States and foreign countries; shipments from inland points in the United States which are consigned to such destinations are authorized to be transported to ship side by rail freight in carload lots only and by motor vehicle in truckload lots only.

(3) Specification 15A, 15B, 15C, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside glass containers not over 1-gallon capacity each, with rubber or ground-in glass stoppers.

(4) The vacant space in containers of these acids must be sufficient so that when raised to a uniform temperature of 130° F. the vapor pressure shall not exceed 6 pounds per square inch.

(d) Fluosilicic acid (hydrofluorosilicic acid) (hydrofluosilicic acid) of not exceeding 32 percent strength may also be shipped when packed in specification containers as follows:

(1) Specification 12B (§ 178.205 of this subchapter). Fiberboard boxes with Specification 2E (§ 178.24a of this subchapter) inside polyethylene bottles or other plastic material resistant to the lading, not over 1-quart capacity each, suitably cushioned to prevent movement within the box. Gross weight of complete package must not exceed 65 pounds.

(2) Spec. 15P or 22C (§§ 178.182 or 178.198 of this subchapter). Glued plywood or wooden box, or plywood drum as prescribed by § 178.198-2(a) of this subchapter, with inside Spec. 2T (§ 178.21 of this subchapter) polyethylene container.

(3) Spec. 6D or 37M (nonreusable container) (§ 178.102 or 178.134 of this subchapter). Cylindrical steel overpacks with inside Spec. 2S or 2SL (§ 178.35 or 178.35a of this subchapter) polyethylene container. Spec. 37M overpack shall be constructed of at least 20-gauge steel and steel and shall not exceed 16 gallons capacity each.

(4) Specification 37P (§ 178.133 of this subchapter). Steel drums, not over 5-gallons capacity, with polyethylene liner (non-reusable container). Not authorized for transportation by air.

(5) Spec. 21P (§ 178.225 of this subchapter). Fiber drum overpack with inside Spec. 2S, 2SL or 2U (§§ 178.35, 178.35a, or 178.24 of this subchapter) polyethylene container.

(6) Specification 34 (§ 178.19 of this subchapter). Polyethylene drum.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[29 FR 18725, Dec. 29, 1964, as amended by Order 71, 31 FR 9071, July 1, 1966; Order 73, 32 FR 3456, Mar. 2, 1967. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.265, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

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[1] Use of existing tank cars authorized, but new construction not authorized.

§ 173.266 Hydrogen peroxide solution in water.

(a) Hydrogen peroxide solution in water containing over 52 percent hydrogen peroxide by weight must be packed in specification containers as follows:

(1) Specification 15A, 15B, 15C, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside glass bottles not over 1-quart capacity each; bottles must have vented closure and must be packed in metal container vented at bottom, packed in another metal container vented at top; cushioning material shall be used between glass bottle and inner container and between inner and outer metal containers; cushioning material shall be vermiculite or equivalent in an amount at least 10 times the volume of the solution shipped and shall be wet with at least 10 percent water by volume to which has been added a stabilizing agent.

(2) Spec. 42D (§ 178.109 of this subchapter). Aluminum drums with vented closure in top head; not over 30 gallons capacity; side openings not permitted. Top head must be plainly marked "KEEP THIS END UP" or "KEEP PLUG UP TO PREVENT SPILLAGE."

(3) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter) under the conditions specified in the IM Tank Table are authorized for shipment of hydrogen peroxide solution in water containing 60 percent or less hydrogen peroxide by weight. Pressure relief devices shall be designed to prevent the entry of foreign matter, the leakage of liquid and the development of any dangerous excess pressure. In addition, the tank shall be designed so that internal surfaces may be effectively cleaned and passivated. The tank shall be clearly marked "FOR HYDROGEN PEROXIDE ONLY." Each tank must be equipped with pressure relief devices conforming to the requirements of the following table:

Concentration of hydrogen peroxide solution	Total venting capacity in standard cubic feet per hour (S.C.F.H.) per pound of hydrogen peroxide solution
52 percent or less	11
Over 52 percent but not greater than 60 percent	22
Over 60 percent but not greater than 70 percent	32

(b) Hydrogen peroxide solution in water containing 52 percent or less hydrogen peroxide by weight must be packaged as prescribed in paragraph (a) or (f) of this section or as follows (vented packagings are not permitted aboard aircraft):

(1) Specification 15A, 15B, 15C, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside glass or earthenware containers of not more than 1-gallon capacity each. Inside containers must be well cushioned with an appropriate fire-resistant cushioning material. Cushioning of inside containers in outside wooden boxes by means of elastic packing, such as wooden strips or large corks fastened securely in position, is authorized if the completed package will pass the swing test prescribed for boxed carboys in Specification 1A (§ 178.1 of this subchapter).

(2) [Reserved]

(3) Spec. 42D (§ 178.109 of this subchapter). Aluminum drums with vented closure in top head; not over 55 gallons capacity. Top heads must be plainly marked "KEEP THIS END UP" or "KEEP PLUG UP TO PREVENT SPILLAGE."

(4) [Reserved]

(5) Specification 12B (§ 178.205 of this subchapter). Fiberboard boxes with Specification 2E (§ 178.24a of this subchapter) inside polyethylene bottles having vented screw-cap closures not over 16-ounce capacity each. Each bottle must be completely contained in a securely closed polyethylene bag or tube constructed of material having minimum film thickness of 0.004 inch. Bottles must be separated from each

other by use of fiberboard partitions or other suitable cushioning material. Not more than 12 bottles may be packaged in one box.

(6) Spec. 6D or 37M (nonreusable container) (§ 178.102 or § 178.134 of this subchapter). Cylindrical steel overpacks with inside Spec. 2S or 2SL (§ 178.35 or § 178.35a of this subchapter) polyethylene container. The closure must be located in one head and must be vented to prevent accumulation of internal pressure and head plainly marked "KEEP THIS END UP" or "KEEP PLUG UP TO PREVENT SPILLAGE."

(7) Specification 21P (§ 178.225 of this subchapter). Fiber drum overpack with inside Specification 2SL (§ 178.35a of this subchapter) polyethylene container not over 55-gallon capacity, or specification 2U (§ 178.24 of this subchapter) polyethylene container not over 15-gallon capacity. The closure of the inside 2SL and 2U container must be vented to prevent accumulation of internal pressure and the head with the closure must be marked "KEEP THIS END UP" or "KEEP PLUG UP TO PREVENT SPILLAGE."

(8) Specification 34 (§ 178.19 of this subchapter). Polyethylene drum. Each drum must have a vented closure to prevent accumulation of internal pressure and the head with the closure must be marked "Keep This End Up."

(9) Specification 37P (§ 178.133 of this subchapter). Steel drums, not over 15-gallon capacity, with inside Specification 2U (§ 178.24 of this subchapter) polyethylene containers having a minimum thickness of 0.015 mil. The closure of the inside 2U container must be vented to prevent accumulation of internal pressure and the head with the closure must be marked "KEEP THIS END UP" or "KEEP PLUG UP TO PREVENT SPILLAGE".

(10) In IM portable tanks as prescribed in paragraph (a)(3) of this section.

(c) Hydrogen peroxide solution in water containing over 8 percent hydrogen peroxide by weight and not exceeding 37 percent must be packaged as prescribed in paragraph (a), (b), or (f) of this section or as follows (vented packagings are not permitted aboard aircraft):

(1) Specification 1A (§ 178.1 of this subchapter). Glass carboys. The cushioning must be non-combustible mineral material, elastic wooden-strip packing, or large elastic cushions such as corks fastened securely in position. The use of hay, excelsior, ground cork, or similar material, whether treated or untreated, is prohibited. The carboy stoppers must be vented so as to prevent accumulation of internal pressure; use of cork gasket impregnated with paraffin is authorized. Not authorized for transportation by air.

(2) Spec. 1X (§ 178.5 of this subchapter). Boxed carboys; single-trip for export only. For shipment by common carriers by water to noncontiguous territories or possessions of the United States and foreign countries; shipments from inland points in the United States which are consigned to such destinations are authorized to be transported to ship side by rail freight in carload lots only and by motor vehicle in truckload lots only.

(3) Specification 1D or 1M (§§ 178.4, 178.17 of this subchapter). Glass carboys in boxes or expanded polystyrene packagings. Pressure in the carboy may not exceed 10 pounds per square inch gauge at 130°F. (55°C.). If the package is vented, there may be no significant release of contents to the environment. For Specification 1D, the cushioning must be non-combustible mineral material, elastic wooden-strip packaging, or large elastic cushions such as corks fastened securely in position; the use of hay, excelsior, ground cork, or similar material, whether treated or untreated, is prohibited. Not authorized for transportation by aircraft.

(4) Specification 15A, 15B, 15C, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside containers of polyethylene, or other plastic material resistant to the lading, not over 1-pint capacity or 16 ounces by weight each. Inside containers must be securely cushioned with an appropriate fire-resistant cushioning material.

(5) Spec. 1H, 15P, or 22C (§§ 178.13, 178.182 or 178.198 of this subchapter).

Metal crate with inside polyethylene carboy; or glued plywood or wooden box, or plywood drum as prescribed by § 178.198-2(a) of this subchapter, with inside Spec. 2T (§ 178.21 of this subchapter) polyethylene container.

(6) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes, with inside aluminum bottles constructed of at least 99 percent pure aluminum of not over 5 pounds or 5 pints capacity each. Each bottle shall be individually partitioned and surrounded by incombustible mineral packing material in the outside shipping container. Bottle closure shall be by means of a threaded aluminum cap, fitted with polyethylene gasket or other equally efficient closing device. A venting device which will not leak liquid under conditions normally incident to transportation is permitted.

(7) [Reserved]

(8) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes with inside polyethylene bottles not over 1 gallon capacity each with vented closures; such bottles over 32 ounces capacity each must be completely contained in a securely closed polyethylene bag or tube constructed of material having minimum film thickness of 0.003 inch. Alkaline solutions containing sodium hydroxide or other alkaline materials packed in glass or polyethylene bottles not over 1 gallon capacity each and with hydrogen peroxide solution contained in polyethylene bottles not over 1 gallon capacity each, when shipped as a wood bleach preparation, may be packed together in inside chipboard or corrugated fiberboard boxes or separated by corrugated fiberboard partitions; not more than six inside chipboard or corrugated fiberboard boxes having inside bottles not over 32 ounces each, or more than 4 one gallon bottles separated by corrugated fiberboard partitions may be packed in one outside box; completed package with mixed contents must be capable of withstanding a drop from a height of four feet onto solid concrete without failure of any inside container.

(9) Spec. 12A (§ 178.210 of this subchapter). Fiberboard boxes with inside glass or polyethylene bottles, not over 1-gallon capacity each. Each bottle closure must be vented and each bottle completely contained in a securely closed polyethylene bag or tube constructed of material having minimum film thickness of 0.003 inch. Shipper must have established that completed package meets test requirements prescribed by § 178.210-10 of this subchapter.

(10) Spec. 16D (§ 178.187 of this subchapter). Wirebound wooden overwrap, with inside Spec. 2T or 2TL (§§ 178.21 or 178.27 of this subchapter) polyethylene container.

(d) Hydrogen peroxide solution in water containing over 8 percent hydrogen peroxide by weight and not exceeding 10 percent must be packaged as prescribed in paragraph (a), (b), (c) or (f) of this section (vented packagings are not permitted aboard aircraft).

(e) Except for transportation by vessel, hydrogen peroxide solution in water not exceeding 52 percent hydrogen peroxide by weight, when shipped in tank cars, tank motor vehicles, or portable tanks in carload or truckload quantities only, is not subject to any other requirement of Parts 170-189 and 397 of this title.

(f) Hydrogen peroxide solution in water exceeding 52 percent hydrogen peroxide by weight may also be packed in specification containers as follows:

(1) Specification 103A-ALW, 103CW, 111A60ALW2 or 111A60W7 (§ 179.200, 179.201 of this subchapter). Tank cars. The 103CW and 111A60W7 tank cars must be fabricated of Type 304L, 316, or 316L stainless steel. (See §§ 173.31(a)(4) and 179.3(e) for additional requirements).

(i) Each tank car must be marked "HYDROGEN PEROXIDE" in accordance with the requirements of § 172.330 of this subchapter.

(2) Specification MC 310 or MC 312 (§ 178.343 of this subchapter). Cargo tanks. Tanks must be fabricated of aluminum conforming to Aluminum Association Nos. 1060, 1260, 5254, or 5652. Specification MC 312 may be fabricated of Type 304L, 316 or 316L stainless steel. They must be built to a design working pressure of not less than 40 psig and shall be designed so that internal surfaces may be effectively cleaned and passivated. All openings in the tank shall be located

on top of tank. All valves and safety devices shall be provided with overturn protection and dust covers. The tank metal identification plate required shall be marked "DOT MC 310-H_2O_2" or "DOT MC 312-AL-H_2O_2," as appropriate, and, in addition, the vehicle shall be clearly marked in letters not less than one inch high "FOR HYDROGEN PEROXIDE ONLY." Designs for venting and pressure relief devices must be examined by the Bureau of Explosives and approved by the Director, OHMT.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[29 FR 18725 Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.266, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.267 Mixed acid (nitric and sulfuric acid) (nitrating acid).

(a) Mixed acid (nitric and sulfuric acid) (nitrating acid), when offered for transportation by carriers by rail freight, highway, or water must be packed in specification containers as follows:

(1) Specification 15A, 15B, 15C, 16A, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside glass bottles not over 7 pounds capacity each, individually inclosed in tightly closed metal cans and cushioned therein with incombustible mineral material.

(2) Spec. 5C (§ 178.83 of this subchapter). Metal barrels or drums of Type 304 ELC or 347 stainless steel only. (See paragraph (b) of this section.)

(3) Specification 103A,[1] 103AW, 111A60W2, or 111A100F2 (§§ 179.200, 179.201 of this subchapter). Tank cars. (See paragraph (b) of this section.)

(4) Specification 1A (§ 178.1 of this subchapter). Carboys in boxes. Authorized only for mixed nitric and sulfuric acid containing not over 17 percent nitric acid and containing at least 33 percent water. Straight-sided carboys must be used; cushioning must be incombustible mineral material, elastic wooden-strip packing, or large elastic cushions, such as cork, fastened securely in position. The use of hay, excelsior, ground cork, or similar material, whether treated or untreated, is prohibited.

(5) Spec. 1X (§ 178.5 of this subchapter). Boxed carboys; single-trip for export only. For shipment by common carriers by water to noncontiguous territories or possessions of the United States and foreign countries; shipments from inland points in the United States which are consigned to such destinations are authorized to be transported to ship side by rail freight in carload lots only and by motor vehicle in truckload lots only.

(6) Specification 1D or 1M (§§ 178.4, 178.17 of this subchapter). Glass carboys in boxes or expanded polystyrene packagings. Authorized only for mixed nitric and sulfuric acid, containing not over 17 percent nitric acid and containing at least 33 percent water. Pressure in the carboy may not exceed 10 pounds per square inch gauge at 130°F. (55°C.). If the package is vented, there may be no significant release of contents to the environment. For Specification 1D, cushioning must be incombustible mineral material, elastic wooden strip packing, or large elastic cushions such as cork fastened securely in position; the use of hay, excelsior, ground cork, or similar material, whether treated or untreated, is prohibited.

(7) Specifications MC 310, MC 311, or MC 312 (§ 178.343 of this subchapter). Tank motor vehicles. (See paragraph (b) of this section.) Bottom outlets are authorized if they meet the requirements of § 178.343-5 of this subchapter.

(8) Spec. 60 (§ 178.255 of this subchapter). Portable tanks. (See paragraph (b) of this section.)

(9) Spec. 5A (§ 178.81 of this subchapter). Carbon steel barrels or drums. Authorized only for mixed acids containing less than 80 percent nitric acid. (See paragraph (b) of this section.)

(10) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter) are authorized under conditions specified in the IM Tank Table.

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[1] The use of existing tanks authorized but new construction not authorized.

(b) Mixtures of sulfuric acid and nitric acid (nitrating acid), shipped in tank cars, cargo tanks, tank trucks, or metal barrels or drums, shall contain not less than 10 percent sulfuric acid. These mixtures may contain:

(1) Up to 10 percent water with not less than 10 percent sulfuric acid.

(2) Up to 15 percent water with not less than 15 percent sulfuric acid.

(3) Up to 20 percent water with not less than 20 percent sulfuric acid.

(4) Up to 38 percent water with not less than 62 percent sulfuric acid.

(c) Mixed acid (nitric and sulfuric acid) (nitrating acid), when offered for transportation by air must be packaged as follows:

(1) Specification 15A, 15B, 15C, 16A, 19A or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside glass bottles with glass stoppers held in place by plaster of Paris covered by strong cloth and securely tied. Glass bottles having necks with molded screw threads must be closed by threaded type acid-resistant plastic caps equipped with an elastic composition cushion and with glass, porcelain or similar liner impervious to the acid. Such caps, when secured in place by at least one complete continuous thread, must be capable of preventing any leakage of the acid.

(2) Or glass bottles having necks with molded screw threads must be closed by threaded-type acid-resistant caps. Caps must be lined with a resilient liner which must be impervious to the acid. Such caps, when secured in place by at least one complete continuous thread, must be capable of preventing any leakage of the acid.

(3) Each bottle must be placed in a tighty closed metal container and well cushioned therein on all sides with an appropriate fire-resistant cushioning material. The metal container must be packed in the outside container, and well cushioned by incombustible mineral packing material.

(4) Not more than 1 quart of mixed acid may be shipped in one outside packaging.

[29 FR 18725, Dec. 29, 1964, as amended by Order 73, 32 FR 3456, Mar. 2, 1967. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.267, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.268 Nitric acid.

(a) Nitric acid exceeding 40 percent concentration in any quantity must not be packed with any other article.

(1) Each tank car must be marked "NITRIC ACID" in accordance with the requirements of § 172.330 of this subchapter.

(b) Nitric acid in any concentration which does not contain significant quantities of sulfuric acid or hydrochloric acid as impurities, when offered for transportation by carriers by rail freight, highway, or water must be packed in specification containers as follows:

(1) Specification 103CW or 111A60W7 (§§ 179.200, 179.201 of this subchapter). Tank cars.

(2) The use of spec. 103C-AL special aluminum alloy tank cars is authorized for the transportation of 95 percent or greater nitric acid as provided in special orders of November 14, 1939, June 7, 1940, and August 19, 1941.

(3) Specifications MC 310, MC 311, or MC 312 (§ 178.343 of this subchapter). Tank motor vehicles. Bottom outlets are authorized if they meet the requirements of § 178.343-5 of this subchapter.

(4) Specification 5C (§ 178.83 of this subchapter). Metal barrels or drums. Authorized for concentrations of nitric acid as limited by § 178.83-3(c) of this subchapter. Containers weighing less than 85 percent of their original marked weight are not authorized.

(5) [Reserved]

(6) Specification 33A (§ 178.150 of this subchapter). Polystyrene case (nonreusable container) with inside glass bottles not over 5-pint capacity each. Not more than four 5-pint bottles may be packed in one outside packaging.

(c) Nitric acid of 80 percent or greater concentration which does not contain significant quantities of sulfuric acid or hydrochloric acid as impurities, when offered for transportation by carriers by rail freight, highway, or water, in addition to and within limitations of paragraphs (b), (d), and (e) of this section, may be packed in specification containers as follows:

(1) Spec. 42B (§§ 178.107 of this subchapter). Aluminum drums.

(2) Specification 103A-ALW or 111A60ALW2 (§§ 179.200, 179.201 of this subchapter). Tank cars. Specification 111A60ALW2 tank cars have a safety relief valve start-to-discharge pressure setting of 45 pounds per square inch.

(d) Nitric acid of 90 percent or greater concentration, when offered for transportation by carriers by rail freight, highway, or water, in addition to and within limitations of paragraphs (b) and (c) of this section, may be packed in specification containers as follows:

(1) Specification 15A, 15B, 15C, 16A, 19A or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside glass bottles not over 5 pints capacity each, individually inclosed in tightly closed metal cans and cushioned therein with appropriate fire-resistant cushioning material. (See paragraphs (g) and (h) of this section).

(2) Specification 105A100-AL-W (§§ 179.100 and 179.201 of this subchapter). Tank cars. Tanks must be fabricated of aluminum alloy which is compatible with the lading, and must be equipped with safety relief valves made of material which is not adversely affected by the lading.

(e) Nitric acid of concentration of less than 90 percent, when offered for transportation by carriers by rail freight, highway, or water, in addition to and within limitations of paragraphs (b), (c), and (f) of this section, may be packed in specification containers as follows:

(1) Specification 15A, 15B, 15C, 16A, 19A or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside glass bottles not over 5 pints capacity each. (See paragraphs (g) and (h) of this section).

(f) Nitric acid of concentration of 72 percent or less, when offered for transportation by carriers by rail freight, highway, or water, in addition to and within limitations of paragraphs (b) and (e) of this section, may be packed in specification containers as follows:

(1) Spec. 1A or 1K (§§ 178.1, 178.14 of this subchapter). Straight-sided carboys in boxes.

(2) Spec. 1X (§ 178.5 of this subchapter). Boxed carboys; single-trip for export only. For shipment by common carriers by water to noncontiguous territories or possessions of the United States and foreign countries; shipments from inland points in the United States which are consigned to such destinations are authorized to be transported to ship side by rail freight in carload lots only and by motor vehicle in truckload lots only.

(3) Specification 1D or 1M (§§ 178.4, 178.17 of this subchapter). Glass carboys in boxes, or expanded polystyrene packagings. Pressure in the carboy may not exceed 10 pounds per square inch gauge at 130°F. (55°C.). If the package is vented, there may be no significant release of contents to the environment.

(4) Cushioning for carboys must be incombustible mineral material, elastic wooden strips, natural cork blocks or rubber blocks. The use of hay, excelsior, loose ground cork, or similar materials, whether treated or untreated, is prohibited.

(5) Spec. 60 (§ 178.255 of this subchapter). Portable tanks, glass-lined.

(6) [Reserved]

(7) Spec. 12R (§ 178.212 of this subchapter). Paper-faced expanded polystyrene board boxes with inside glass bottles not over 5 pints capacity each. Not more than six 5-pint bottles shall be packed in one outside shipping container.

(g) Closures for bottles. Glass stoppers ground to fit and held in place by plaster of Paris covered by a strong cloth securely tied; or:

(1) Threaded-type acid-resistant caps with gasket or lining impervious to the acid and sufficiently resilient, or cushioned, to give an acidproof closure; at least 1 complete continuous thread is required to be engaged when bottle is closed for shipment.

(h) Cushioning inside containers. Inside containers must be well cushioned. Except as provided in paragraph (h)(1) of this section, all material for cushioning must be incombustible mineral material such as whiting, mineral wool, infusorial earth (Kieselguhr), sifted ashes, etc. The use of hay, excelsior, ground cork, or similar material, whether treated or untreated, is prohibited. Where the cushioning material is very fine or powdery, separate partitions for the individual inside containers shall be provided to prevent bottles from shifting and coming in contact with each other, and the box must be tight to prevent sifting of cushioning material.

(1) Cushioning of inside containers in outside specification wooden boxes by means of elastic packings, such as wooden strips, large corks, or pads formed of an expanded polystyrene resin that is resistant to the action of nitric acid, fastened securely in position, is authorized if the completed package will pass the swing test prescribed for boxed carboys.

(i) Nitric acid of any concentration, when offered for transportation by air, must be packaged as follows:

(1) Specification 15A, 15B, 15C, 16A, 19A or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside glass bottles with glass stoppers held in place by plaster of Paris covered by strong cloth and securely tied. Glass bottles having necks with molded screw threads must be closed by threaded-type acid-resistant plastic caps equipped with an elastic composition cushion and with glass, porcelain or similar liner impervious to the acid. Such caps, when secured in place by at least one complete continuous thread, must be capable of preventing any leakage of the acid.

(2) Or glass bottles having necks with molded screw threads must be closed by thread-type acid-resistant caps. Caps must be lined with a resilient liner which must be impervious to the acid. Such caps, when secured in place by at least one complete continuous thread, must be capable of preventing any leakage of the acid.

(3) Each bottle must be placed in a tightly closed metal container, and well cushioned therein on all sides with an appropriate fire-resistant cushioning material. The metal container must be packed in outside containers, and well cushioned by incombustible mineral packing material.

(4) Not more than 5 pints of nitric acid shall be shipped in one outside package.

(j) Nitric acid of 50 percent or less concentration, when offered for transportation by air, may in addition to the provisions of paragraph (i) of this section be packaged as follows:

(1) Specification 15A, 15B, 15C, 16A, 19A, 19B or 12B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191, 178.205 of this subchapter). Wooden or fiberboard boxes with not over 12 inside glass ampoules having a capacity of not over 4 fluid ounces each. Each ampoule must be well cushioned with incombustible mineral packing material, such as vermiculite or other equally efficient material, and be packed in a cylindrical cardboard tube having wall thickness of at least ⅛ inch, with the inside coated with wax, and be equipped with metal bottom and metal screw-cap top. Inside packages must be separated by efficient means.

(k) Specification IM 101 portable tanks §§ 178.270 and 178.271 of this subchapter), under conditions specified in the IM Tank Table. Authorized for nitric acid of any concentration.

[29 FR 18725, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.268, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.269 Perchloric acid.

(a) Perchloric acid in excess of 72 percent must not be shipped. When not exceeding 72 percent strength must be packed in specification containers as follows:

(1) Specification 15A, 15B, 15C, 16A, 19A or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside glass bottles not over 5 pints capacity each, cushioned with incombustible mineral material in sufficient quantity to absorb any leakage.

(2) Specification 1A, 1D, 1K, or 1M (§§ 178.1, 178.4, 178.14, 178.17 of this subchapter). Glass carboys in boxes or expanded polystyrene packagings. Not authorized for transportation by aircraft.

(3) Spec. 1X (§ 178.5 of this subchapter). Boxed carboys; single-trip for export only. For shipment by common carriers by water to noncontiguous territories or possession of the United States and foreign countries; shipments from inland points in the United States which are consigned to such destinations are authorized to be transported to ship side by rail freight in carload lots only and by motor vehicle in truckload lots only.

(4) Spec. 33A (§ 178.150 of this subchapter). Polystyrene cases (nonreusable container) with inside glass bottles not over 5 pints capacity each. Not more than four 5-pint bottles may be packed in one outside container.

(5) Spec. 12R (§ 178.212 of this subchapter). Paper-faced expanded polystyrene board boxes with inside glass bottles not over 5 pints capacity each. Not more than six 5-pint bottles shall be packed in one outside shipping container.

(6) Specification 6D (§ 178.102 of this subchapter). Cylindrical steel overpack with inside specification 2S (§ 178.35 of this subchapter) polyethylene container not exceeding 30-gallon capacity. Maximum net weight may not exceed 380 pounds. Not authorized for transportation by air.

(7) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter), under conditions specified in the IM Tank Table. Authorized only for perchloric acid not exceeding 50 percent by weight.

(8) Specification 34 (§ 178.19 of this subchapter). Polyethylene drum. Authorized for perchloric acid not exceeding 50% strength only. The shipper shall assure conformance with the requirements of § 173.24(d) of this part prior to first shipment.

(b) Cushioning for carboys must be incombustible mineral material, elastic wooden strips, natural cork blocks or rubber blocks. The use of hay, excelsior, loose ground cork, or similar materials, whether treated or untreated, is prohibited.

(c) Perchloric acid in any quantity must not be packed with any other article.

(d) Closures for bottles. Required as follows:

(1) Glass stoppers ground to fit and held in place by plaster of Paris covered by a strong cloth securely tied.

(2) Threaded-type acid-resistant caps with a gasket or lining impervious to the acid and sufficiently resilient, or cushioned, to give an acid-proof closure: at least one complete continuous thread is required to be engaged when bottle is closed for shipment.

(e) Inside containers must be well cushioned with an appropriate fire-resistant cushioning material. The use of hay, excelsior, ground cork, or similar material either treated or untreated, is prohibited. Where the cushioning material is very fine or powdery, separate partitions for the individual inside containers should be provided to prevent the bottles from shifting and coming in contact with each other, and the box must be tight to prevent sifting of cushioning material.

(1) Cushioning of inside containers in outside wooden boxes by means of elastic packings, such as wooden strips, large corks, or pads formed of an expanded polystyrene resin that is resistant to the action of perchloric acid, fastened securely in position, is authorized if the completed package will pass the swing test prescribed for boxed carboys.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[29 FR 18725, Dec. 29, 1964, as amended by Order 66, 30 FR 5746, Apr. 23, 1965. Redesignated at 32 FR 5606, Apr. 5, 1967]

Editorial Note: For Federal Register citations affecting § 173.269, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.270 Phosphorus tribromide.

(a) Phosphorus tribromide must be packed in specification containers as follows:

(1) Specification 15A, 15B, 15C, 16A, 19A or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside glass or earthenware containers not over 1-gallon capacity each, except that inside containers up to 3 gallons each are authorized when only one container is packed in an outside box.

(2) Specification 5K or 5M (§§ 178.88, 178.90 of this subchapter).

Nickel or monel drums not over 10 gallons capacity each.

(3) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter) are authorized under conditions specified in the IM Tank Table.

[Amdt. 173-14, 45 FR 59892, Sept. 11, 1980, as amended by Amdt. 173-144, 46 FR 9894, Jan. 29, 1981; 46 FR 24184, Apr. 30, 1981; Amdt. 173-149, 46 FR 49901, Oct. 8, 1981]

§ 173.271 Methyl phosphonic dichloride, phosphorus oxybromide, phosphorus oxychloride, phosphorus trichloride, and thiophosphoryl chloride.

(a) Methyl phosphonic dichloride, phosphorus oxybromide, phosphorus oxychloride, phosphorus trichloride, and thiophosphoryl chloride must be placed in specification containers as follows:

(1) Specification 34 (§ 178.19 of this subchapter). Polyethylene drum. Authorized for phosphorus oxychloride only. The shipper shall assure conformance with the requirements of § 173.24(d) of this part prior to first shipment.

(2) Spec. 5K (§ 178.88 of this subchapter). Nickel drums.

(3) Specification 6D (§ 178.102 of this subchapter). Cylindrical steel overpack with inside Specification 2S or 2SL (§§ 178.35, 178.35a of this subchapter) polyethylene packaging. Polyethylene used must be Type III as set forth in Appendix B—Specifications for Plastics to Part 178 of this Title. Authorized for phosphorus oxychloride and thiophosphoryl chloride only.

(4) Specification 15A, 15B, 15C, 16A, 19A or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside glass or earthenware containers not over 1-gallon capacity each, except that inside containers not over 3 gallons each are authorized when only one container is packed in an outside box.

(5) [Reserved]

(6) Spec. 60 (§ 178.255 of this subchapter). Portable tanks when tanks are lead-lined.

(7) Spec. 103ANW (§§ 179.200 and 179.201 of this subchapter). Tank cars. Tank must be of solid nickel at least 99 percent pure and all cast metal parts of the tank in contact with the lading have a minimum nickel content of approximately 96.7 percent.

(8) Specification MC 310,[1] MC 311,[1] or MC 312 (§§ 178.340, 178.343 of this subchapter). Tank motor vehicles, subject to the following conditions:

(i) Lead-lined or nickel-lined tanks. If nickel-lined, the lining must consist of at least one thirty-second inch of uncontaminated nickel at all points including rivets, welds and other joints, and edges of tank plates.

(ii) Tanks fabricated from Type 316 stainless steel or clad with Type 316 stainless steel having a minimum thickness of 0.2 times the design thickness of the parent metal, are authorized only for phosphorus oxychloride, phosphorus trichloride and thiophosphoryl chloride.

(iii) Tanks made from mild steel or austenitic stainless steel, without lining or cladding. Authorized only for phosphorus trichloride.

(iv) Specification MC 311[1] or MC 312 tank motor vehicles only. Tanks must be constructed of nickel at least 99 percent pure with all cast metal parts of the tank in contact with the lading having a minimum nickel content of approximately 96.7 percent. Authorized only for phosphorus oxychloride and phosphorus trichloride.

(9) Specification 103A,[1] 103AW, 111A60W2, or 111A100F2 (§§ 179.200, 179.201 of this subchapter). Tank cars. Specification 103A,[1] tanks must be lead-lined steel or made of steel at least 10 percent nickel clad. Specification 103AW, 111A60W2, or 111A100F2 tanks must be lead-lined steel or made of steel with a minimum thickness of nickel cladding $^{1}/_{16}$-inch. Nickel cladding in tanks must have a minimum nickel content of at least 99 percent pure nickel.

(10) Spec. 103EW (§§ 179.200 and 179.201 of this subchapter). Tank cars made from Type 316 stainless steel. Authorized for phosphorus trichloride and thiophosphoryl chloride only.

(11) Specification 103A,[1] 103AW, 103CW, 111A60W2, or 111A100F2 (§§ 179.200, 179.201 of this subchapter). Tank cars. Specification 103CW

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[1] The use of existing tanks authorized but new construction not authorized.

must be fabricated from Type 430 stainless steel. Authorized for phosphorus trichloride only.

(12) Spec. 5A or 5C (§ 178.81 or § 178.83 of this subchapter). Metal barrels or drums. Authorized for phosphorus trichloride and thiophosphoryl chloride.

(13)—(15) [Reserved]

(16) Spec. 17C (§ 178.115 of this subchapter). Metal drums (single-trip) with no opening exceeding 2.3 inches in diameter. When drums are not constructed of stainless steel they must be lined with a material impervious to the lading. Authorized for phosphorus trichloride only.

(17) Spec. 5M (§ 178.90 of this subchapter). Monel drums not over 10 gallons capacity each.

(18) Spec. 5B (§ 178.82 of this subchapter). Metal barrels or drums lined with a material which is compatible with the commodity. Authorized for thiophosphoryl chloride only.

(19) Spec. 1M (§ 178.17 of this subchapter). Glass carboys in expanded polystyrene packagings. Authorized only for phosphorus oxychloride. Not authorized for transportation by aircraft.

(20) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter) are authorized under conditions specified in the IM Tank Table.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[29 FR 18725, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.271, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.272 Sulfuric acid.

(a) Sulfuric acid (oleum, oil of vitriol, etc.) must be packed in specification containers as follows:

(b) Limited quantities of sulfuric acid solutions in concentrations of 25 percent or less, in inside packagings of not over 8 fluid ounces capacity each, packed in strong outside packagings and cushioned with absorbent material in sufficient quantity to completely absorb liquid contents in event of breakage, are excepted from labeling (except when offered for transportation by air) and the specification packaging of this subchapter. In addition, shipments are not subject to Subpart F of Part 172 of this subchapter, to Part 174 of this subchapter except § 174.24 and to Part 177 of this subchapter except § 177.817.

(c) *Sulfuric acid concentration of 51 percent or less.* Authorized packaging is described in paragraphs (1) through (16), (24) through (26) of paragraph (i) of this section.

(d) *Sulfuric acid concentration of greater than 51 percent to not over 65.25 percent.* Authorized packaging is described in paragraphs (1) through (16) and (27) through (29) of paragraph (i) of this section.

(e) *Sulfuric acid concentration of greater than 65.25 percent to not over 77.5 percent.* Authorized packaging is described in paragraphs (1) through (16), (20) through (22) and paragraph (29) of paragraph (i) of this section.

(f) *Sulfuric acid concentration of greater than 77.5 percent to not over 95 percent.* Authorized packaging is described in paragraphs (1) through (22) and paragraph (29) of paragraph (i) of this section.

(g) *Sulfuric acid concentration of greater than 95 percent to not over 100.5 percent.* Authorized packaging is described in paragraphs (i) (1) through (4), (6), (9), (14) through (22), and (29) of this section.

(h) *Sulfuric acid concentration of over 100.5 percent.* Authorized packaging is described in paragraphs (i) (1) through (4), (17), and (19) through (23) of this section.

(i) Authorized packagings are described as follows:

(1) Specification 15A, 15B, 15C, 16A, 19A or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside glass containers not over 1-gallon capacity each, except that inside containers not over 3 gallons each are authorized when only one container is packed in an outside box.

(2) Specification 12A (§ 178.210 of this subchapter). Fiberboard boxes with inside glass bottles not over 5 pints capacity each. Not more than six 5-pint glass bottles may be packed in one outside container. Shipper must have established that the completed package meets the test requirements

prescribed in § 178.219-10 of this subchapter.

(3) Specification 33A (§ 178.150 of this subchapter). Polystyrene cases (nonreusable container) with inside glass bottles not over 5 pints capacity each. Not more than four 5-pint bottles may be packed in one outside container.

(4) Specification 1X (§ 178.5 of this subchapter). Boxed carboys; single-trip for export only. For shipment by water to noncontiguous territories or possessions of the United States and foreign countries; shipments from inland points in the United States which are consigned to such destinations are authorized to be transported to ship side by rail freight in carload lots only and by motor vehicle in truckload lots only.

(5) Specifications 1H, 15P, or 22C (§§ 178.13, 178.182, 178.198 of this subchapter). Metal crate with an inside polyethylene carboy; or glued plywood or wooden box, or plywood drum as prescribed by § 178.198-2(a) of this subchapter with an inside Specification 2T or 2TL (§§ 178.21, 178.27 of this subchapter) polyethylene container.

(6) Specification 6D or 37M (nonreusable container) (§§ 178.102, 178.134 of this subchapter). Cylindrical steel overpacks with an inside Specification 2S, 2SL, or 2T (§§ 178.35, 178.35a, 178.21 of this subchapter) polyethylene container. Overpack of over 30-gallon capacity must be constructed of at least 16-gauge steel throughout when used for sulfuric acid of 93 percent or greater concentration.

(7) Specification 16D (§ 178.187 of this subchapter). Wirebound wooden overwrap, with an inside Specification 2T, 2TL, 2S, or 2SL (§§ 178.21, 178.27, 178.35, 178.35a of this subchapter), polyethylene container.

(8) Specification 21P (§ 178.225 of this subchapter). Fiber drum overpack with an inside Specification 2T or 2U (§§ 178.21, 178.24 of this subchapter) polyethylene container not over 15-gallon capacity.

(9) Specification 34 (§ 178.19 of this subchapter). Polyethylene drum.

(10) Specification 16A (§ 178.185 of this subchapter). Wirebound wooden box (§ 178.185-22 of this subchapter) with an inside Specification 2U (§ 178.24 of this subchapter) polyethylene container. The polyethylene container must be separated from the wooden box by a complete corrugated fiberboard liner and top and bottom pads. Not authorized for transportation by air.

(11) Spec. 12P (§ 178.211 of this subchapter). Fiber board box with one inside Specification 2U (§ 178.24 of this subchapter) polyethylene container of not over 5-gallon capacity, or two inside Specification 2U polyethylene containers of not over 2½ gallon capacity each. Wire staples are not authorized for assembly or closure of boxes, except when polyethylene container is completely enclosed in inside boxes free of wire staples or other projections that could cause failures. Not authorized for transportation by air.

(12) Specification 12B (§ 178.205 of this subchapter). Fiberboard boxes with inside polyethylene containers or other containers of plastic compatible with the chemical, not over 1-gallon capacity each. Inside containers must be cushioned to prevent movement in the outside box. Not more than four 1-gallon inside containers may be packed in one outside container. Authorized gross weight not over 75 pounds.

(13) Specification 12R (§ 178.212 of this subchapter). Paperfaced expanded polystyrene board boxes with inside Specification 2E (§ 178.24a of this subchapter) polyethylene bottles not over 1-gallon capacity each. Not more than four 1-gallon capacity each. Not more than four 1-gallon polyethylene bottles may be packed in one outside packaging.

(14) Specification 12R (§ 178.212 of this subchapter). Paperfaced expanded polystyrene board boxes with inside glass bottles not over 5 pints capacity each. Not more than six 5-pint bottles may be packed in one outside shipping container.

(15) Specification 1A or 1K (§§ 178.1, 178.14 of this subchapter). Carboys in boxes. Not authorized for transportation by aircraft.

(16) Specification 1D or 1M (§§ 178.4, 178.17 of this subchapter). Glass carboys in boxes or expanded

polystyrene packagings. Not authorized for transportation by aircraft.

(17) Specification 5A (§ 178.81 of this subchapter). Metal barrels or drums. Authorized for sulfuric acid of 77.5 percent or greater concentrations, with or without an inhibitor, provided such acid has a corrosive effect on steel no greater than 93.2 percent sulfuric acid, measured at 100° F.

Note 1: Tapered steel plugs, without gaskets, for standard Specification 5A flanges are authorized. Threaded length must not be less than 1.5 inches. Major diameter of plug must not be over $2\frac{11}{32}$ inches, and minor diameter not less than $2\frac{7}{32}$ inches.

(18) Specification 17F (§ 178.117 of this subchapter). Metal barrels or drums (single-trip only). Drums equipped with vented closures of an experimental type examined by the Bureau of Explosives and approved by the Director, OHMT are also authorized for export shipments. Authorized for sulfuric acid of 77.5 percent to 98 percent concentrations with or without an inhibitor, provided such acid has a corrosive effect on steel no greater than 93.2 percent sulfuric acid, measured at 100°F.

(19) Specification 5C (§ 178.83 of this subchapter). Metal barrels or drums of Type 304, 316, or 347 stainless steel or other types of stainless steel of at least equivalent corrosion resistance and physical properties. Authorized for sulfuric acid of 93 percent or greater concentrations.

(20) Specification 60 (§ 178.255 of this subchapter). Portable tank. Authorized for sulfuric acid of 65.25 percent of greater concentrations provided the corrosive effect in steel is not greater than that of 65.25 percent sulfuric acid, measured at 100° F.

(21) Specification MC 310, MC 311, or MC 312 (§ 178.343 of this subchapter). Tank motor vehicles. Authorized for sulfuric acid of concentrations 65.25 percent or greater concentrations, provided the corrosive effect in steel is not greater than that of 65.25 percent sulfuric acid, measured at 100° F. Bottom outlets are authorized if they meet the requirements of § 178.343-5 of this subchapter.

(22) Specification 103A,[1] 103AW, 103CW, 105A300W, 111A60W2, 111A100W6, or 111A100F2 (§§ 179.100, 179.101, 179.200, 179.201 of this subchapter). Tank cars. Authorized for sulfuric acid of concentrations 65.25 percent or greater, provided the corrosive effect in steel is not greater than that of 65.25 percent sulfuric acid, measured at 100° F. Tank cars used for sulfuric acid, mixed acid (nitric and sulfuric acids) (nitrating acid), and other fuming acids, may be equipped with safety vents incorporating frangible discs having a ⅛-inch breather hole in their center. The ⅛-inch breather hole is not permitted in frangible discs of safety vents on oleum tank cars. Specification 103CW and 111A100W6 tank cars must have tanks constructed of type 304-L stainless steel. Bottom outlets are not authorized.

(23) Specification 115A60W6 (§ 179.220 of this subchapter). Tank cars. Tanks must be constructed of Type 304 or 316 stainless steel. Bottom outlets must be rendered inoperative and blanked off.

(24) Specifications 60 (§ 178.255 of this subchapter). Rubber-lined portable tanks.

(25) Specification MC 310, MC 311, or MC 312 (§ 178.343 of this subchapter). Cargo tanks must be lined with rubber or equally acid-resistant material of equivalent strength and durability. Bottom outlets are authorized if they meet the requirements of § 178.343-5 of this subchapter.

(26) Specification 103B,[1] 103BW, or 111A60W5 (§§ 179.200, 179.201 of this subchapter). Lined tank cars.

(27) Specification 103AW, 111A100F2, or 111A60W2 (§§ 179.200, 179.201 of this subchapter). Tank cars having tanks equipped with a phenolic lining impervious to the lading.

(28) Specification MC 310, MC 311, or MC 312 (§ 178.343 of this subchapter). Cargo tanks must be lined with rubber or equally acid-resistant material of equivalent strength and durability. Bottom outlets are authorized if they meet the requirements of

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[1] The use of existing tanks authorized but new construction not authorized.

§ 178.343-5 of this subchapter. Not authorized for transportation by vessel.

(29) Marine portable tanks meeting the requirements of 46 CFR Part 64 authorized for highway and cargo vessel only when shipped in support of off-shore oil well drilling activities. Tanks shall comply with mounting and tie-down requirements of § 178.245-4 of this subchapter when transported by highway. Authorized for sulfuric acid of concentrations up to 65.25 percent. Concentrations up to 100.5 percent are also authorized if the corrosive effect on steel is not greater than that of 65.25 percent sulfuric acid measured at 100° F.

(30) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter), under conditions specified in the IM Tank Table. Sulfuric acid of concentrations greater than 62.5 percent is authorized provided the corrosive effect on steel is not greater than that of 65.25 percent sulfuric acid, measured at 100° F.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[29 FR 18725, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.272, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.273 Sulfur trioxide.

(a) Sulfur trioxide, stabilized, must be packed in specification containers as follows:

(1) Specification 15A, 15B, 15C, 16A, 19A or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside glass containers not over 1-gallon each.

(2) Spec. 5A or 5C (§ 178.81 or § 178.83 of this subchapter). Metal barrels or drums, not over 55 gallons capacity each.

(3) Spec. 17F (§ 178.117 of this subchapter). Metal drums (single-trip).

(4) Specification 103A,[1] 103AW, 105A100W, 111A60W2, or 111A100F2 (§§ 179.100, 179.101, 179.200, 179.201 of this subchapter). Tank cars. Authorized only for stabilized sulfur trioxide. Tank cars must have safety valves of approved design and not subject to rapid deterioration by the lading. Cars equipped with interior heater coils not permitted. Specification 103AW tank cars may be equipped with standpipe electrical heaters approved by the AAR Committee on Tank Cars.

(i) Each tank car must be marked "Sulfur Trioxide" in accordance with the requirements of § 172.330 of this subchapter.

(5) Specifications MC 310, MC 311, or MC 312 (§ 178.343 of this subchapter). Tank motor vehicles. Authorized only for stabilized sulfur trioxide. Tanks must be equipped with spring-relief safety valves. Tanks equipped with interior heater coils not permitted. Bottom outlets are authorized if they meet the requirements of § 178.343-5 of this subchapter.

(b) Sulfur trioxide, unstabilized, must be packed in specification containers as follows:

(1) Cylinders as prescribed for any compressed gas, except acetylene. Cylinders must be closed by metal plugs or valves. If valves are used, they must be protected by a valve protection cap, and each valve outlet must be capped or plugged. Cylinders must have a minimum service pressure of 400 psig and a maximum capacity of one gallon. Safety relief devices are not permitted. Cylinders must be overpacked in strong outside containers.

(2) Specification MC 311 or MC 312 (§ 178.343 of this subchapter). Tank motor vehicles. Tanks must be insulated and equipped with a safety relief valve. If the valve incorporates a rupture disc it may not exceed a maximum pressure of one and one-half times the design pressure of the tank. Tanks equipped with interior heater coils not permitted.

(3) Specification 105A300W (§ 179.100, 179.101 of this subchapter). Tank car. Tank car must be externally coiled and have a safety relief valve set at not more than 225 psig. Cars equipped with interior heater coils not permitted.

(i) Each tank car must be marked "SULFUR TRIOXIDE" in accordance with the requirements of § 172.330 of this subchapter.

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[1] The use of existing tank cars authorized, but new construction not authorized.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[29 FR 18725, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

Editorial Note: For Federal Register citations affecting § 173.273, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.274 Fluosulfonic acid.

(a) Fluosulfonic acid must be packed in containers as follows:

(1) Specification 15A, 15B, 15C, 16A, 19A or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside containers not over 1-gallon each, except that inside containers not over 3 gallons each are authorized when only one container is packed in an outside box, as prescribed in Note 1 and 2 to this section.

Note 1: Bottles manufactured of Pyrex glass or glass of equal acid resistance, authorized only for material containing an excess of sulfur trioxide, with Pyrex glass stoppers, or glass stoppers of equal acid resistance, ground to fit and held in place by plaster of Paris covered by strong cloth securely tied; each bottle must be placed in a metal container, well cushioned therein with an appropriate fire-resistant cushioning material.

Note 2: Or steel containers, 14 gauge steel throughout, welded heads and side seams, equipped with ¾ inch welded flange and plug. Threads for plug must be 8 or less per inch. Each drum must be tested for leakage with 15 pounds hydrostatic pressure.

(2) Spec. 5A or 17F (single-trip) (§ 178.81 or § 178.117 of this subchapter). Metal barrels or drums not over 55 gallons capacity each.

(3) Specification 103A,[1] 103AW, 111A60W2, or 111A100F2 (§§ 179.200, 179.201 of this subchapter). Tank cars.

(4) Specification MC 310, MC 311, or MC 312 (§ 178.343 of this subchapter). Tank motor vehicles.

(5) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter) are authorized under conditions specified in the IM Tank Table.

[29 FR 18725, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

Editorial Note: For Federal Register citations affecting § 173.274, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.275 Difluorophosphoric acid, anhydrous, monofluorophosphoric acid, anhydrous, hexafluorophosphoric acid, and mixtures thereof.

(a) Difluorophosphoric acid, anhydrous, monofluorophosphoric acid, anhydrous, hexafluorophosphoric acid, and mixtures thereof must be packed in specification containers as follows:

(1) Specification 15A, 15B, 15C, 16A, 19A or 19B (§§ 178.168, 176.169, 178.170, 178.185, 178.190 of this subchapter) wooden boxes, Spec. 12B (§ 178.205 of this subchapter) fiberboard boxes, or Spec. 21C (§ 178.224 of this subchapter) fiber drums with inside polyethylene or other nonfragile plastic bottles resistant to the lading, not over 2 gallons capacity each, closed by means of threaded acid-resistant caps; caps must have at least one complete continuous thread and be additionally sealed to the bottle to prevent turning of cap after bottle is closed.

(2) Spec. 42B or 42D (§§ 178.107, 178.109 of this subchapter). Aluminum drums not over 55 gallons capacity.

(3) Spec. 22C (§ 178.198 of this subchapter). Plywood drums as prescribed by § 178.198-2(a) of this subchapter, with inside Spec. 2T (§ 178.21 of this subchapter) polyethylene container.

(4) Spec. 60 (§ 178.255 of this subchapter). Portable tanks. Authorized for inhibited acids enumerated in this paragraph only.

(5) Specification 6D (§ 178.102 of this subchapter). Cylindrical steel overpack with inside Specification 2S or 2SL (§§ 178.35, 178.35a of this subchapter) polyethylene packaging. Net weight may not exceed 550 pounds.

(6) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter), under conditions specified in the IM Tank Table. Mixtures of these materials are not authorized in IM portable tanks.

(b) Inside containers must be packed so they cannot change position in the outside container while in transit and inert absorbent cushioning material must be used where necessary.

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[1] The use of existing tanks authorized but new construction not authorized.

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EDITORIAL NOTE: For Federal Register citations affecting § 173.275, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.276 Anhydrous hydrazine and hydrazine solution.

(a) Anhydrous hydrazine and hydrazine solution must be packed in specification containers as follows:

(1) Specification 1D or 1M (§§ 178.4, 178.17 of this subchapter). Glass carboys in boxes or expanded polystyrene packagings. Not authorized for transportation by aircraft.

(2) Spec. 15A, 15B, 15C, 19A or 19B (§§ 178.168, 178.169, 178.170, 178.190, 178.191, of this subchapter). Wooden boxes with inside glass bottles not exceeding 1-gallon capacity each, cushioned by means of vermiculite within tin cans which shall be tightly closed.

(3) Spec. 5, 5A, 5C, or 17E (single-trip) (§§ 178.80, 178.81, 178.83, or § 178.116 of this subchapter). Metal barrels or drums which shall be of type 304 or 347 stainless steel, with openings not exceeding 2.3 inches in diameter.

(4) Specification 103CW, 111A60W7, or 111A100W6 (§§ 179.200, 179.201 of this subchapter). Tank cars having tanks of Type 304L or 347 stainless steel with molybdenum content not exceeding one-half of 1 percent. The safety relief valve on Specification 103CW tank car tanks may have a start-to-discharge pressure of not more than 45 p.s.i. in place of 35 p.s.i. Specification 111A100W6 tank cars must not be equipped with bottom outlet. Bottom washout permitted. Vapor space in tanks must be filled with nitrogen gas at atmospheric pressure.

(5) Specification 103A-ALW or 111A60ALW2 (§§ 179.200, 179.201 of this subchapter). Tank cars. The safety relief valve on tanks may not have a start-to-discharge pressure of more than 45 p.s.i. in place of 35 p.s.i. Vapor space in tanks must be filled with nitrogen gas at atmospheric pressure. Authorized for anhydrous hydrazine only.

(6) Specifications MC 310, MC 311, or MC 312 (§ 178.343 of this subchapter). Tank motor vehicles having tanks of Type 304L or 347 stainless steel with molybdenum content not exceeding one-half of 1 percent. Vapor space in tank must be filled with nitrogen gas at not less than atmospheric pressure. Bottom outlets are authorized if they meet the requirements of § 178.343-5 of this subchapter.

(7) Spec. 37M (nonreusable container) (§ 178.134 of this subchapter). Cylindrical steel overpack with inside Spec. 2SL (§ 178.35a of this subchapter) polyethylene container. Authorized for hydrazine solution only

(8) Spec. 42B or 42D (§§ 178.107, 178.109 of this subchapter). Aluminum drums. Authorized for anhydrous hydrazine only.

(9) Specification 12B (§ 178.205 of this subchapter). Fiberboard box with one inside Specification 2E (§ 178.24a of this subchapter) polyethylene bottle not over 4½-quart capacity. Polyethylene bottle must be of Type III high density polyethylene having a minimum wall thickness of 30 mils and bottle must be securely closed with a screw cap. Authorized for hydrazine solution only.

(10) Specification 34 (§ 178.19 of this subchapter). Polyethylene drum. Authorized for hydrazine solution only.

(11) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter), under conditions specified in the IM Tank Table. Authorized only for hydrazine solution containing not more than 64 percent hydrazine by weight.

(12) Specification 57 (§ 178.253 of this subchapter). Stainless steel portable tank. Authorized for hydrazine, aqueous solution only. Authorized for transportation by water when having a minimum design pressure of 9 psig and equipped in accordance with § 178.253-4, except that frangible devices are not authorized. Also, for water transportation, no pressure relief device may open at less than 5 psig.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[29 FR 18725, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.276, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.277 Hypochlorite solutions.

(a) Hypochlorite solutions containing more than 7 percent available chlorine by weight must be packed in specification containers as follows:

(1) Specification 15A, 15B, 15C, 19A or 19B (§§ 178.168, 178.169, 178.170, 178.190, 178.191 of this subchapter) wooden boxes or Spec. 12A or 12B (§§ 178.210, 178.205 of this subchapter) fiberboard boxes with inside glass, earthenware or polyethylene packagings of not more than 1 gallon capacity each. Gross weight must not exceed 65 pounds nor contain more than 4 glass or earthenware inside packagings if their capacity is greater than 5 pints each, or more than six such polyethylene packagings.

(2) Specification 1A, 1D, or 1M (§§ 178.1, 178.4, 178.17 of this subchapter). Glass carboys in boxes or expanded polystyrene packagings. Not authorized for transportation by aircraft.

(3) Spec. 1H, 15P, or 22C (§§ 178.13, 178.182, or § 178.198 of this subchapter). Metal crate with inside polyethylene carboy; or glued plywood or wooden box, or plywood drum as prescribed by § 178.198-2(a) of this subchapter, with inside Spec. 2T (§ 178.21 of this subchapter) polyetnylene container. Spec. 15P glued plywood or wooden box may contain Spec. 2S (§ 178.35 of this subchapter) polyethylene drum. Authorized for not over 16 percent sodium hypochlorite solution only.

(4) Specification 6D or 37M (nonreusable container) (§§ 178.102, 178.134 of this subchapter). Cylindrical steel overpacks with inside Specification 2S or 2SL (§§ 178.35, 178.35a of this subchapter) polyethylene liners. Authorized for not over 16 percent sodium hypochlorite solution only.

(5) Spec. 12P (§ 178.211 of this subchapter). Fiberboard boxes with inside Specification 2U (§ 178.24 of this subchapter) polyethylene container of not over 5-gallon capacity or two inside Specification 2U polyethylene containers of not over 2½-gallon capacity each. Wire staples are not authorized for assembly or closure of boxes, except when polyethylene container is completely enclosed in inside boxes free of wire staples or other projections that could cause failures. Not authorized for transportation by air.

(6) Specification 34 (§ 178.19 of this subchapter). Polyethylene drum. Authorized for not over 16% sodium hypochlorite solution only. Vented closures are authorized if head with closure is marked "Keep This End Up."

(7) Specification 21P (§ 178.225 of this subchapter). Fiber drum overpack with inside Specifications 2S, 2SL, 2T, or 2U (§§ 178.35, 178.35a, 178.21, 178.24 of this subchapter) polyethylene container. Authorized for not over 16 percent sodium hypochlorite solutions only.

(8) Specification 37P (§ 178.133 of this subchapter). Steel drums with polyethylene liner (nonreuseable container). Containers must be vented to prevent accumulation of pressure and the head with closure must be marked "KEEP THIS END UP." Authorized for not over 16 percent solutions of sodium hypochlorite only.

(9) Specification MC 310, MC 311 or MC 312 (§ 178.243 of this subchapter). Tank motor vehicles. Tanks must be lined with rubber or other materials resistant to the lading. Continued use of nonspecification cargo tanks used to transport hypochlorite solutions prior to January 1, 1983, is authorized.

(10) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter) are authorized under conditions specified in the IM Tank Table.

(b) Closures for inside containers and carboys must be vented and must be of a material resistant to the lading and capable of preventing leakage of liquid contents.

(c) Specification 57 (§ 178.253 of this subchapter). Steel portable tank. Authorized for not over 15 percent solutions of sodium hypochlorite only. Authorized for transportation by water when having a minimum design pressure of 9 psig and equipped in accordance with § 178.253-4, except that frangible devices are not authorized. Also, for water transportation, no pressure relief device may open at less than 5 psig. Tanks constructed of a steel other than stainless steel must have a polythylene liner impervious to the solution. Vented closures are authorized.

(d) Limited quantities of this material in glass inside packaging of not more than 4 fluid ounces capacity each, packed in strong outside packaging, and cushioned with absorbent material in sufficient quantity to completely absorb liquid contents in the event of breakage, are excepted from labeling (except when offered for transportation by air) and the specification packaging requirements of this subchapter.

(1) Polyethylene pouches not over 2½ ounces capacity each, heat sealed, and formed of polyethylene, or other suitable plastic, not less than .0035 inch in thickness to which shall be laminated a .0015 inch, 25-pound basis weight white sulphate paper, when securely packed not more than 144 pouches in a strong fiberboard box (absorbent cushioning material not required), are exempt from specification packaging, marking, and labeling requirements, except that marking name of contents on outside container is required for shipments via carrier by water. Shipments for transportation by highway carriers are exempt also from Part 177 of this subchapter, except § 177.817.

(e) Limited quantities of this material in polyethylene pouches not over 2½ ounces capacity each, heat sealed, and formed of polyethylene, or other suitable plastic, not less than 0.0035-inch in thickness to which must be laminated a 0.0015-inch, 25-pound basis weight white sulphate paper, when securely packed not more than 144 pouches in a strong fiberboard box, are excepted from labeling (except when offered for transportation by air) and the specification packaging requirements, of this subchapter. In addition, shipments are not subject to Subpart F of Part 172 of this subchapter, to Part 174 of this subchapter except § 174.24 and to Part 177 of this subchapter, except § 177.817.

(f) Special exceptions for shipment of certain hypochlorite solutions in the ORM-D class are provided in Subpart N of this part.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[29 FR 18725, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.277, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.278 Nitrohydrochloric acid.

(a) Nitrohydrochloric acid, which is a mixture of nitric acid not over 1.42 specific gravity and hydrochloric acid not over 1.19 specific gravity in the approximate proportions of one part nitric acid and three parts hydrochloric acid, must be packed in specification containers as follows:

(1) Specification 15A, 15B, 15C, 16A, 19A or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside glass containers of not over 5 pints capacity each, individually enclosed in tightly closed metal cans and cushioned therein with sufficient incombustible mineral material.

(2) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter) are authorized under conditions specified in the IM Tank Table.

(b) Nitrohydrochloric acid diluted, is a solution of nitrohydrochloric acid as described in paragraph (a) of this section, which has been diluted to not less than five times the volume of water and must be packed in specification containers as follows:

(1) Specification 15A, 15B, 15C, 16A, 19A or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside glass containers of not over 5 pints capacity each, individually enclosed in tightly closed metal cans and cushioned therein with sufficient incombustible mineral material.

(2) Specification 1A, 1D, or 1M (§§ 178.1, 178.4, 178.17 of this subchapter). Glass carboys in boxes or expanded polystyrene packagings. Rated capacity may not exceed 5 gallons for Specification 1A and not over 6.5 gallons nominal capacity for Specifications 1D and 1M. Not authorized for transportation by aircraft.

[29 FR 18725, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.278, see the List of CFR

Sections Affected appearing in the Finding Aids section of this volume.

§ 173.279 Anisoyl chloride.

(a) Anisoyl chloride must be packed in specification containers as follows:

(1) Spec. 5C (§ 178.83 of this subchapter). Metal barrels or drums.

(2) Spec. 5 (§ 178.80 of this subchapter). Metal barrels or drums of stainless steel only, with flanges for closures welded in place and having no opening exceeding 2.3 inches in diameter.

(3) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter) are authorized under conditions specified in the IM Tank Table.

(b) Limited quantities of this material in inside packagings of not over 8 fluid ounces capacity each, packed in strong outside packaging, and cushioned with absorbent material in sufficient quantity to completely absorb liquid contents in the event of breakage, are excepted from labeling (except that labeling is required for transportation by air) and specification packaging requirements of this subchapter. In addition, shipments are not subject to Subpart F of Part 172 of this subchapter, to Part 174 of this subchapter except § 174.24 and to Part 177 of this subchapter except § 177.817.

[29 FR 18725, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.279, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.280 Trichlorosilanes.

(a) Allyl trichlorosilane, amyl trichlorosilane, butyl trichlorosilane, chlorophenyl trichlorosilane, cyclohexenyl trichlorosilane, cyclohexyl trichlorosilane, dichlorophenyl trichlorosilane, diphenyl dichlorosilane, dodecyl trichlorosilane, ethyl phenyl dichlorosilane, hexadecyl trichlorosilane, hexyl trichlorosilane, nonyl trichlorosilane, octadecyl trichlorosilane, octyl trichlorosilane, phenyl trichlorosilane, and propyl trichlorosilane must be packaged as follows;

(1) Specification 15A, 16B or 19B (§§ 178.168, 178.186, 178.191 of this subchapter). Wooden boxes with inside glass containers not over 1-gallon capacity each, securely closed and cushioned with incombustible absorbent material.

(2) Spec. 17H or 37A (§ 178.118 or § 178.131 of this subchapter). Metal drums (single-trip), with glass inside containers not over 1 gallon capacity each securely closed and cushioned with incombustible absorbent material.

(3) Spec. 5A (§ 178.81 of this subchapter). Metal drums not over 55 gallons capacity.

(4) [Reserved]

(5) Specification 5, 5B, 5C, and 17E single-trip (§§ 178.80, 178.82, 178.83, 178.116 of this subchapter). Metal drums. Not authorized for shipment by air.

(6) Specification steel or nickel cylinders as prescribed for any compressed gas except acetylene.

(7) Specification 103W, 103A,[1] 103AW, 105A100,[1] 105A100W, 111A60F1, 111A60W1, 111A60W2, 111A100F2, or 111A100W4 (§§ 179.100, 179.101, 179.200, 179.201 of this subchapter). Tank cars.

(8) Specifications MC 310, MC 311, or MC 312 (§ 178.343 of this subchapter). Tank motor vehicles of steel or stainless steel construction. Bottom outlets are authorized if they meet the requirements of § 178.343-5 of this subchapter.

(9) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter) are authorized under conditions specified in the IM Tank Table.

[29 FR 18725, Dec. 29, 1964, as amended by Order 73, 32 FR 3457, Mar. 2, 1967. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.280, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.281 Benzyl bromide (bromotoluene, alpha).

(a) Benzyl bromide (bromotoluene, alpha) must be packed in specification containers as follows:

(1) Specification 15A, 15B, 15C, or 19B (§§ 178.168, 178.169, 178.170,

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[1] The use of existing tank cars authorized, but new construction not authorized.

178.190, 178.191 of this subchapter). Wooden boxes with inside glass bottles not over 1-gallon capacity each, closed by means of screw caps which are resistant to action of the contents. Bottles must be packed in metal cans having slip-on or friction closures and cushioned in outside boxes with incombustible material.

(2) Spec. 5K or 5M (§ 178.88 or 178.90 of this subchapter). Nickel or monel barrels or drums. Spec. 5M drums shall not be over 10 gallons capacity.

(3) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter) are authorized under conditions specified in the IM Tank Table.

[29 FR 18725, Dec. 29, 1964, as amended by Order 66, 30 FR 5746, Apr. 23, 1965; Order 67, 30 FR 7422, June 5, 1965. Redesignated at 32 FR 5606, Apr. 5, 1967]

Editorial Note: For Federal Register citations affecting § 173.281, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.282 Isopropyl percarbonate, stabilized.

(a) Isopropyl percarbonate, stabilized, must be packed in specification containers as follows:

(1) Specification 15A, 15B, 15C, 16A, 19A or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside glass or earthenware containers not over 2 gallons capacity each which must be maintained at a temperature below 75°F. Shipments are authorized only by private or contract motor vehicle.

[29 FR 18725, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16079, Apr. 15, 1976; Amdt. 173-149, 46 FR 49902, Oct. 8, 1981]

§ 173.283 Fluoboric acid.

(a) Fluoboric acid exceeding 50 percent concentration must be packed as prescribed in § 173.264(a) for hydrofluoric acid.

(b) Fluoboric acid of 50 percent concentration or less must be packed as follows:

(1) In specification packaging as prescribed in paragraph (a) of this section.

(2) In specification packaging as prescribed in § 173.245(a) (12), (16), (18), (19), (21), (24), and (26).

[Amdt. 173-86, 39 FR 37062, Oct. 17, 1974, as amended by Amdt. 173-94, 41 FR 16079, Apr. 15, 1976; Amdt. 173-16, 48 FR 50460, Nov. 1, 1983]

§ 173.284 Tungsten hexafluoride.

(a) Tungsten hexafluoride must be packed in specification containers as follows:

(1) Specification 3A, 3AA, 3BN, or 3E (§§ 178.36, 178.37, 178.39, 178.42 of this subchapter). Cylinders. Cylinders shall be equipped with a valve protection cap or be packed in a strong outside container adequate to protect valves. Outlets of any valves must be capped or plugged. As an alternate, the cylinder opening may be closed by the use of a metal plug. Specification 3E cylinders must be shipped in an overpack.

[Amdt. 173-125, 43 FR 57893, Dec. 11, 1978]

§ 173.286 Chemical kits.

(a) Chemical kits, except as otherwise provided in Parts 170-189 of this subchapter, must be packed, marked, and labeled as prescribed by this part for the specific corrosive materials contained therein.

(b) Chemical kits containing limited quantities of corrosive liquids in inside packagings of not over 6 fluid ounces capacity each are excepted from labeling (except when offered for transportation by air) and the specification packaging requirements of this subchapter if all of the following requirements are complied with. In addition, shipments are not subject to Subpart F of Part 172 of this subchapter, to Part 174 of this subchapter except § 174.24 and to Part 177 of this subchapter except § 177.817.

(1) The kit may not contain any corrosive liquid for which no exception from packaging requirements of this Part 173 is permitted by the commodity list in § 172.101 of this subchapter.

(2) The kit must be a strong wooden or metal container, or must be packed in a strong wooden or metal container.

(3) The corrosive liquids must be cushioned with sufficient absorbent cushioning material to completely

absorb the contents of the individual containers, and must be protected from injury by other materials in the kit.

(4) The contents of the kit must be of a nature and packed so there will be no possibility of the mixture of contents causing dangerous evolution of heat or gas.

(c) Chemical kits containing corrosive liquids and other chemicals not classed as hazardous materials used for photographic processing, except as otherwise provided for in Parts 170-189 of this subchapter, must be packed in specification containers as follows:

(1) Spec. 12A (§ 178.210 of this subchapter). Fiberboard boxes with inside glass bottles not over 32 ounces capacity each, securely cushioned and separated from other inside containers. The contents of the kit must be of such nature and so packed that there will be no possibility of the mixture of contents causing dangerous evolution of heat or gas. Shipper must have established that the completed package meets test requirements prescribed by § 178.210-10 of this subchapter.

[29 FR 18725, Dec. 29, 1964, as amended by Order 66, 30 FR 5746, Apr. 23, 1965. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.286, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.287 Chromic acid solution.

(a) For the purposes of the regulations in this part, a chromic acid solution is a solution of chromic acid (chromium trioxide) in water, with or without other acids, containing 35 percent or more of chromic acid by weight. (For solutions containing less than 35 percent chromic acid, see paragraph (c) of this section.) Packagings authorized must be of a design and be constructed of materials that will not react dangerously with or be decomposed by the chemical solution packaged therein.

(b) Chromic acid solutions must be packaged in specification containers as follows:

(1) Specification 1A (§ 178.1 of this subchapter), Glass carboy in a box. Not authorized for transportation by air.

(2) Specifications 5, 5A, 5B (§§ 178.80, 178.81, 178.82 of this subchapter). Metal barrel or drum with openings not exceeding 2.3 inches in diameter. Authorized for solutions containing chromic acid only.

(3) Specification 17E (§ 178.116 of this subchapter) steel drum. Authorized for solutions containing chromic acid only.

(4) Specification 12A or 12B (§§ 178.210 or 187.205 of this subchapter). Fiberboard box with one inside glass container not over 4-fluid ounce capacity, packed in a wax-lined cylindrical fiber carton with metal ends. The bottle closure must consist of a tighty secured, fitted, ground glass stopper. Space between the bottle and the inner surface of the fiber cylinder must be filled with an appropriate fire-resistant cushioning material in sufficient quantity to completely absorb the contents of the bottle in the event of breakage. Not authorized for solutions containing nitric acid.

(5) Specification 12R (§ 178.212 of this subchapter). Paper-faced expanded polystyrene board box with inside glass bottles not over 5 pints capacity each. Not more than six 5-pint bottles may be packaged in one box. Each bottle must be well cushioned. Partitioning and cushioning must be provided to prevent bottles from shifting, or coming in contact with each other, the box wall, or the bottom. Each bottle closure must consist of a tightly secured, fitted, ground glass stopper, or a threaded-type, acid-resistant cap with a gasket or lining impervious to the acid, sufficiently resilient or cushioned to give an acidproof, leakproof closure.

(6) Specification 33A (§ 178.150 of this subchapter). Polystyrene case (nonreusable container) with inside glass bottles not over 5 pints capacity each. Not more than four 5-pint bottles may be packaged in one outside container. Each bottle closure must consist of a tightly secured, fitted, ground glass stopper, or a threaded-type, acid-resistant cap with a gasket or lining impervious to the acid, sufficiently resilient or cushioned to give an acidproof, leakproof closure.

(7) Specification 29 (§ 178.226 of this subchapter). Mailing tube with glass

bottles not over 1 ounce capacity each. Each bottle must be well cushioned. Partitioning and cushioning must be provided to prevent bottles from shifting or coming in contact with each other or the tube wall, bottom, or top.

(8) Specification MC 312 (§§ 178.340, 178.343 of this subchapter). Tank motor vehicles. Authorized for solutions containing chromic acid only. Not authorized for transportation by water.

(9) Specification 34 (§ 178.19 of this subchapter). Polyethylene drum. The shipper shall assure conformance with the requirements of § 173.24(d) of this part prior to first shipment.

(c) Solutions containing chromic acid in water in concentration not exceeding 35 percent by weight, with or without other acids, and which are not otherwise regulated by Subpart E of this part, must be described as "Corrosive liquids, n.o.s." In addition to the packaging and the limitations prescribed therefor in paragraph (b) of this section, solutions of this composition may also be packaged as follows:

(1) In packaging as prescribed in § 173.245, except (a)(4), (14), (15), (18), (19), and (24).

(2) Specification 21P (§ 178.225 of this subchapter). Fiber drum overpack with inside Specification 2S or 2SL (§§ 178.35, 178.35a of this subchapter) polyethylene container.

(3) Specifications 5, 5A, 5B (§§ 178.80, 178.81, 178.82 of this subchapter). Metal barrel or drum with openings not exceeding 2.3 inches in diameter. Authorized for solutions containing chromic acid only.

(4) Specification 17E (§ 178.116 of this subchapter) steel drum. Authorized for solutions containing chromic acid only.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 173-57, 36 FR 21289, Nov. 5, 1971, as amended by Amdt. 173-94, 41 FR 16079, Apr. 15, 1976; Amdt. 173-111, 42 FR 58938, Nov. 14, 1977]

EDITORIAL NOTE: For Federal Register citations affecting § 173.287, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.288 Chloroformates.

(a) Allyl chloroformate, benzyl chloroformate, ethyl chloroformate, and methyl chloroformate must be packaged as follows:

(1) Specification 15A, 15B, 15C, or 19B (§§ 178.168, 178.169, 178.170, 178.191 of this subchapter). Wooden boxes with inside glass containers of not over 1-pint capacity each, cushioned with incombustible mineral material.

(2) Specification 1A (§ 178.1 of this subchapter). Boxed carboys. Glass bottles having nominal capacity of 3 gallons also authorized when packed and tested in accordance with requirements of Specification 1A (§ 178.1 of this subchapter); necks must be protected during shipment. Not authorized for transportation by air.

(b) [Reserved]

(c) Spec. 16D (§ 178.187 of this subchapter). Wooden wirebound overwrap having one inside Spec. 2SL (§ 178.35a of this subchapter) polyethylene container not over 55 gallons capacity. Authorized for ethyl chloroformate or methyl chloroformate only.

(d) Specification 6D or 37M (§§ 178.102, 178.134 of this subchapter). Cylindrical steel overpack with inside Specifications 2S, 2SL, or 2T (§§ 178.35, 178.35a, 178.21 of this subchapter) polyethylene container. Authorized for ethyl chloroformate and methyl chloroformate only.

(e) Specification 34 (§ 178.19 of this subchapter). Polyethylene drum.

(f) Specification 111A100W2, 111A100W4, 112A200W, or 112A400F (§§ 179.100, 179.101, 179.200, 179.201 of this subchapter). Tank cars. Authorized only for ethyl chloroformate and methyl chloroformate.

(g) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter), under conditions specified in the IM Tank Table. Authorized only for allyl chloroformate and benzyl chloroformate.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[29 FR 18725, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.288, see the List of CFR

Sections Affected appearing in the Finding Aids section of this volume.

§ 173.289 Formic acid and formic acid solutions.

(a) Formic acid and formic acid solutions must be packed in specification containers as follows:

(1) In containers prescribed in § 173.245, except Spec. 5A, 17C, 17E or 17F (§§ 178.81, 178.115, 178.116 or 178.117 of this subchapter). Metal barrels or drums.

(2) Specification 103ALW, 103CW, 103EW, 111A60ALW, or 111A100W6 (§§ 179.200, 179.201 of this subchapter). Tank cars. Specification 103EW tanks must be of Type 316 stainless steel. Specification 111A100W6 tanks must be of Type 304L or 316L stainless steel. Specification 103ALW tanks without bottom outlets and Specification 111A60ALW tanks are authorized only for concentrations of 97 percent or greater and must be equipped with top loading and unloading devices. Specification 111A100W6 tanks are authorized only for concentrations of 80 percent or greater, must have bottom outlets effectively sealed, and must be equipped with top loading and unloading devices. Specifications 103ALW and 111A60ALW are not authorized for transportation by water.

(i) Each tank car authorized under this section must be marked "FORMIC ACID" in accordance with the requirements in § 172.330 of this subchapter.

(3) [Reserved]

(4) Specifications MC 310, MC 311, or MC 312 (§ 178.343 of this subchapter). Tank motor vehicles. Bottom outlets are authorized if they meet the requirements of § 178.343-5 of this subchapter.

(5) [Reserved]

(6) Spec. 5 (§ 178.80 of this subchapter). Metal barrels or drums of stainless steel only, with flanges for closures welded in place and having no opening exceeding 2.3 inches in diameter.

(7) Specification 17H (§ 178.118 of this subchapter). Metal drums (single-trip) equipped with bag type liners of material and construction approved by the Department. Each drum must have two diametrically opposite vent holes ¼ inch diameter in the side wall at each end in close proximity to the top curl and bottom chime. Interior of welded side seam must be covered or otherwise treated to provide a nonabrasive surface. Not authorized for transportation by air.

(8) Spec. 60 (§ 178.255 of this subchapter). Portable tanks, marked "FOR FORMIC ACID ONLY".

(9) Specification 1EX (§ 178.6 of this subchapter). Carboys in plywood drums. Not authorized for transportation by air.

(10) Spec. 1H (§ 178.13 of this subchapter). Metal crate with inside polyethylene carboy.

(11) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter), under conditions specified in the IM Tank Table. The tank must be marked "FOR FORMIC ACID ONLY."

[29 FR 18725, Dec. 29, 1964, as amended by Order 73, 32 FR 3457, Mar. 2, 1967. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.289, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.290 Mixtures of hydrofluoric and sulfuric acid.

(a) Mixtures of hydrofluoric acid and sulfuric acid, containing not more than 80 percent by weight and not less than 70 percent by weight of hydrofluoric acid and sulfuric acid combined, with the hydrofluoric acid content not less than 25 percent by weight in any case, must be packed in specification containers as follows:

(1) Spec. 5A (§ 178.81 of this subchapter). Unlined metal barrels or drums which have been subjected to an adequate passivation or neutralization process (see Note 1). Containers must be filled to not over 80 percent of capacity at 68° F. If containers are washed out with water, they must be repassivated before shipment.

NOTE 1: Each metal container, before being put into this service, must be passivated by the following or an equally efficient method: By filling drum to 90 percent of capacity with hydrofluoric acid of 58 percent strength and allowing drum to stand 48 hours at a temperature of 80° F., and then ½ hours at 140° F., the internal pressure maintained at atmospheric pressure by means of a ventilated bung.

(2) Containers not exceeding 55 gallons capacity each are authorized for carload, truckload, less-than-carload, and less-than-truckload shipment. Containers exceeding 55 gallons capacity each are authorized for carload or truckload shipments only but they must be loaded by consignor and unloaded by consignee.

(3) For less-than-carload or less-than-truckload shipments, containers must be of metal at least as heavy as 14 gauge United States standard for not over 20 gallons capacity each or 12 gauge for not over 55 gallons capacity each. Each container must be subjected to at least one of the following tests before shipment: By interior pressure of at least 15 pounds per square inch before filling or by holding for inspection for at least 24 hours after filling. In either case, each container must be vented prior to shipment.

(4) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter) are authorized under conditions specified in the IM Tank Table.

[29 FR 18725, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.290, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.291 Flame retardant compound, liquid.

(a) Flame retardant compound, liquid, must be packaged as follows:

(1) Specification 1A (§ 178.1 of this subchapter). Carboys in boxes which must be closed, and when reused must be reconditioned and tested, as provided in the specification. Not authorized for transportation by aircraft.

(2) Specification 1D or 1M (§§ 178.4, 178.17 of this subchapter). Glass carboys in boxes or expanded polystyrene packagings. Pressure in the carboy may not exceed 10 pounds per square inch gauge at 130° F. (55° C.). If the package is vented, there may be no significant release of contents to the environment. Not authorized for transportation by aircraft.

(3) Spec. IX (§ 178.5 of this subchapter). Boxed carboys; single-trip for export only. For shipment by common carriers by water to noncontiguous territories or possessions of the United States and foreign countries; shipments from inland points in the United States which are consigned to such destinations are authorized to be transported to ship side by rail freight in carload lots only and by motor vehicle in truckload lots only.

(4)—(5) [Reserved]

(6) Specification 15A, 15B, 15C, 16A, 19A or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside glass or earthenware containers not over 1-gallon capacity each, except that containers not over 3 gallons are authorized when only one is packed in an outside box.

(7) [Reserved]

(8) Specification 103B,[1] 103BW, or 111A60W5 (§§ 179.200, 179.201 of this subchapter). Tank cars.

[29 FR 18725, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.291, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.292 Hexamethylene diamine solution.

(a) Hexamethylene diamine solution must be packed in specification containers as follows:

(1) In containers prescribed in § 173.249.

(2) Specifications MC 300, MC 301, MC 302 or MC 305. Tank motor vehicles.

[29 FR 18725, Dec. 29, 1964, as amended by Order 73, 32 FR 3457, Mar. 2, 1967. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.292, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.293 Iodine monochloride.

(a) Iodine monochloride must be packed in specification containers as follows:

(1) Specification 15A, 15B, or 19B (§§ 178.168, 178.169, 178.191 of this subchapter). Wooden boxes with

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[1] The use of existing tanks authorized but new construction not authorized.

inside containers not over 1-quart capacity each; or with stone or earthenware jugs not over 1-gallon capacity each.

(2) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter) are authorized under conditions specified in the IM Tank Table.

(b) Outage (vacant space above liquid) for inside containers must be not less than 15 percent.

(c) Inside containers must be securely closed by hermetical sealing or by glass or stone stoppers ground to fit and securely fastened or by screw caps fitted with gaskets of suitable material resistant to the contents.

(d) Inside containers must be securely cushioned on all sides with incombustible cushioning material which will not produce heat when in contact with iodine monochloride.

[29 FR 18725, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.293, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.294 Monochloroacetic acid, liquid or solution.

(a) Monochloroacetic acid, liquid or solution, must be packed in specification containers as follows:

(1) In containers prescribed in § 173.245(a) (1), (2), (3), or (7).

(2) Specification 103ANW, 103AW, 111A60W2, or 111A100F2 (§§ 179.200, 179.201 of this subchapter). Tank cars. Specification 103AW, 111A60W2, or 111A100F2 tank cars must be nickel clad at least 20 percent.

(3) Specifications MC 310, MC 311, or MC 312 (§ 178.343 of this subchapter). Tank motor vehicles. Tanks to be fabricated from 99 percent pure nickel plates, Type 304 or 316 stainless steel, or be suitably lined. Bottom outlets are authorized if they meet the requirements of § 178.343-5 of this subchapter.

(4) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter) are authorized under conditions specified in the IM Tank Table.

(b) Monochloroacetic acid, anhydrous, when shipped as a liquid must be shipped in Specification 103ANW fabricated of 99 percent pure nickel or in Specification 103AW or 111A60W2, nickel clad at least 20 percent or be provided with a suitable corrosive resistant coating or lining.

[29 FR 18725, Dec. 29, 1964, as amended by Order 73, 32 FR 3457, Mar. 2, 1967. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.294, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.295 Benzyl chloride.

(a) Benzyl chloride must be packed in specification containers as follows:

(1) Specification 15A, 15B, 15C, 16A, 19A or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside glass or earthenware containers not over 1-gallon capacity each, except that inside containers not over 3 gallons each are authorized when only one is packed in an outside box.

(2) [Reserved]

(3) Specifications 1A, 1D, or 1M (§§ 178.1, 178.4, 178.17 of this subchapter). Glass carboys in boxes or expanded polystyrene packagings. Not authorized for transportation by aircraft.

(4) Spec. 1X (§ 178.5 of this subchapter). Boxed carboys; single-trip for export only. For shipment by common carriers by water to noncontiguous territories or possessions of the United States and foreign countries; shipments from inland points in the United States which are consigned to such destinations are authorized to be transported to ship side by rail freight in carload lots only and by motor vehicle in truckload lots only.

(5) Spec. 5A or 17C (single-trip) (§ 178.81 or § 178.115 of this subchapter). Metal barrels or drums with openings not exceeding 2.3 inches in diameter. Authorized for stabilized benzyl chloride only.

(6) Spec. 5K (§ 178.88 of this subchapter). Nickel drums. When shipped in unstabilized condition, the lading must be anhydrous and must be free from impurities such as iron.

(7) [Reserved]

(8) Spec. 60 (§ 178.255 of this chapter). Portable tanks. Benzyl chloride must be stabilized when loaded in unlined tanks.

(9) Specifications MC 310, MC 311, or MC 312 (§ 178.343 of this subchapter). Tank motor vehicles. Authorized for stabilized benzyl chloride only. Bottom outlets are authorized if they meet the requirements of § 178.343-5 of this subchapter.

(10) Specifications MC 310, MC 311, or MC 312 (§ 178.343 of this subchapter). Tank motor vehicles fabricated from 99 percent pure nickel plates. All cast metal parts of the tank in contact with the lading must have a minimum nickel content of 96.7 percent. When shipped in unstabilized condition, the lading must be anhydrous and must be free from impurities such as iron. Bottom outlets are authorized if they meet the requirements of § 178.343-5 of this subchapter.

(11) Specification 103A,[1] 103AW, 111A60W2, or 111A100F2 (§§ 179.200, 179.201 of this subchapter). Tank cars.

(12) Specification 103ANW (§§ 179.200, 179.201 of this subchapter). Tank cars. All cast metal parts of the tank in contact with the lading must have a minimum nickel content of approximately 96.7 percent. When shipped in unstabilized condition, the lading must be anhydrous and must be free from impurities such as iron.

(13) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter) are authorized under conditions specified in the IM Tank Table.

[29 FR 18725, Dec. 29, 1964, as amended by Order 73, 32 FR 3457, Mar. 2, 1967. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.295, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.296 Di iso octyl acid phosphate.

(a) Di iso octyl acid phosphate must be packed in specification containers as follows:

(1) Spec. 17E (§ 178.116 of this subchapter). Metal drums (single-trip) with openings not exceeding 2.3 inches in diameter.

(2) Specifications MC 310, MC 311, or MC 312 (§ 178.343 of this subchapter). Tank motor vehicles. Bottom outlets are authorized if they meet the requirements of § 178.343-5 of this subchapter.

(3) Specification 103AW, 103CW, 103EW, 111A60W2, 111A60W7, or 111A100F2 (§§ 179.200, 179.201 of this subchapter). Tank cars.

(4) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter) are authorized under conditions specified in the IM Tank Table.

[29 FR 18725, Dec. 29, 1964, as amended by Order 73, 32 FR 3457, Mar. 2, 1967. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.296, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.297 Titanium sulfate solution containing not more than 45 percent sulfuric acid.

(a) Titanium sulfate solution containing not more than 45 percent sulfuric acid must be packed in specification containers as follows:

(1) Specifications MC 310, MC 311, or MC 312 (§ 178.343 of this subchapter). Tank motor vehicles, rubber-lined. Bottom outlets are authorized if they meet the requirements of § 178.343-5 of this subchapter.

(2) Specification 103B,[1] 103BW, or 111A60W5 (§§ 179.200, 179.201 of this subchapter). Tank cars.

(3) Spec. 15A, 15B, 15C, 16A or 19A (§§ 178.168, 178.169, 178.170, 178.185 or § 178.190 of this subchapter). Wooden boxes with inside glass or earthenware containers, not over 1 gallon capacity each.

(4) Specification 6D (§ 178.102 of this subchapter). Cylindrical steel overpack with inside Specification 2S (§ 178.35 of this subchapter) polyethylene container not over 30-gallons capacity. Overpack of over 15 gallons must be constructed of at least 18-gauge steel throughout.

(5) Specification 21P (§ 178.225 of this subchapter). Fiber drum overpack with inside Specification 2U (§ 178.24 of this subchapter) polyethylene container not over 15-gallon capacity or Specification 2SL (§ 178.35a of this subchapter) polyethylene container

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[1] The use of existing tanks authorized but new construction not authorized.

[1] Use of existing tank cars authorized, but new construction not authorized.

not over 55-gallon capacity. Authorized only for solutions containing not over 20 percent sulfuric acid.

(6) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter) are authorized under conditions specified in the IM Tank Table.

(7) Specification 34 (§ 178.19 of this subchapter). Polyethylene container without overpack, not over 30-gallon capacity.

[29 FR 18725, Dec. 29, 1964, as amended by Order 73, 32 FR 3457, Mar. 2, 1967. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.297, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.299 Etching acid liquid, n.o.s.

(a) Etching acid liquid shall be a mixture of nitric acid, hydrofluoric acid, having nitric acid in concentrations of not more than 60 percent by weight, hydrofluoric acid in concentrations of not less than 4 percent by weight and water not less than 24 percent by weight, and may contain acetic acid. These mixtures must be packed in specification containers as follows:

(1) Specification 12A (§ 178.210 of this subchapter). Fiberboard boxes with Specification 2E (§ 178.24a of this subchapter) inside polyethylene bottles having a minimum wall thickness of 0.030 inch and screw-cap closures. Net weight per bottle may not be over 10 pounds each. The net weight per package may not be more than 40 pounds.

(2) Specification 6D or 37M (non-reusable) (§§ 178.102, 178.134 of this subchapter). Cylindrical steel overpack with inside Specification 2S or 2SL (§§ 178.35, 178.35a of this subchapter) polyethylene container not over 55-gallon capacity. Specification 37M overpack of over 30-gallon capacity must be constructed of at least 20-gauge steel throughout.

(b) All outside shipping containers must be plainly marked "NONREUSABLE CONTAINER." All components of the package must not be reused.

[29 FR 18725, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.299, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.299a Tris-(1-aziridinyl) phosphine oxide.

(a) Tris-(1-aziridinyl) phosphine oxide must be packed in specification containers as follows:

(1) In containers as prescribed in § 173.245, not over 5 gallons capacity each.

[29 FR 18743, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

Subpart G—Gases; Definition and Preparation

§ 173.300 Definitions.

For the purpose of Parts 170–189 of this subchapter, the following terminology is defined:

(a) *Compressed gas.* The term "compressed gas" shall designate any material or mixture having in the container an absolute pressure exceeding 40 p.s.i. at 70° F. or, regardless of the pressure at 70° F., having an absolute pressure exceeding 104 p.s.i. at 130° F.; or any liquid flammable material having a vapor pressure exceeding 40 p.s.i. absolute at 100° F. as determined by ASTM Test D-323.

(b) *Flammable compressed gas.* Any compressed gas as defined in paragraph (a) of this section shall be classed as "flammable gas" if any one of the following occurs:

(1) Either a mixture of 13 percent or less (by volume) with air forms a flammable mixture or the flammable range with air is wider than 12 percent regardless of the lower limit. These limits shall be determined at atmospheric temperature and pressure. The method of sampling and test procedure shall be acceptable to the Bureau of Explosives and approved by the Director, OHMT.

(2) Using the Bureau of Explosives' Flame Projection Apparatus (see Note 1), the flame projects more than 18 inches beyond the ignition source with valve opened fully, or, the flame flashes back and burns at the valve with any degree of valve opening.

(3) Using the Bureau of Explosives' Open Drum Apparatus (see Note 1),

there is any significant propagation of flame away from the ignition source.

(4) Using the Bureau of Explosives' Closed Drum Apparatus (see Note 1), there is any explosion of the vapor-air mixture in the drum.

NOTE 1: A description of the Bureau of Explosives' Flame Projection Apparatus, Open Drum Apparatus, Closed Drum Apparatus, and method of tests may be procured from the Bureau of Explosives.

(c) *Non-liquefied compressed gas.* A "non-liquefied compressed gas" is a gas, other than gas in solution, which under the charged pressure is entirely gaseous at a temperature of 70° F.

(d) *Liquefied compressed gas.* A "liquefied compressed gas" is a gas which, under the charged pressure, is partially liquid at a temperature of 70° F.

(e) *Compressed gas in solution.* A "compressed gas in solution" is a nonliquefied compressed gas which is dissolved in a solvent.

(f) *Cryogenic liquid.* A "cryogenic liquid" is a refrigerated liquefied gas having a boiling point colder than −130°F. (−90°C.) at one atmosphere, absolute. A material meeting this definition is subject to requirements of this subchapter without regard to whether it meets the definition of a compressed gas in paragraph (a) of this section. The material is partially described as "* * *, refrigerated liquid (*cryogenic liquid*)" in § 172.101 of this subchapter.

(g) *Flammable range.* The term "flammable range" shall designate the difference between the minimum and maximum volume percentages of the material in air that forms a flammable compressed gas.

(h) *Service pressure.* The term "service pressure" shall designate the authorized pressure marking on the container. For example, for cylinders marked "DOT 3A1800", the service pressure is 1800 psig (pounds per square inch gauge).

(i) *Refrigerant gas or Dispersant gas.* The term "Refrigerant gas" or "Dispersant gas" applies to all flammable or nonflammable, nonpoisonous refrigerant gases, dispersant gases (fluorocarbons) listed in §§ 172.101, 173.304(a)(2), 173.314(c), 173.315(a)(1) and 173.315(h), and mixtures thereof, or any other compressed gas meeting one of the following:

(1) A nonflammable mixture containing not less than 50% fluorocarbon content, having a vapor pressure not exceeding 260 psig at 130° F.

(2) A flammable mixture containing not less than 50% fluorocarbon content, not over 40% by weight of a flammable component, having a vapor pressure not exceeding 260 psig at 130° F.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[29 FR 18743, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.300, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.300a Approval of independent inspection agency.

(a) Any person who (1) does not manufacture cylinders for use in the transportation of hazardous materials and (2) is not directly or indirectly controlled by any person or firm which manufactures cylinders for use in the transportation of hazardous materials, may apply to the Department of Transportation for approval as an independent inspection agency for the purpose of performing cylinder inspections and verifications required by Part 178 of this subchapter.

(b) Each application filed under this section for approval as an independent inspection agency must:

(1) Be submitted in writing to: Office of Hazardous Materials Transportation, U.S. Department of Transportation, Washington, D.C. 20590;

(2) State the name, address, principal business activity, and telephone number of the applicant and the name and address of each facility where tests and inspections are to be performed;

(3) State the name, address and principal business activity of each person having any direct or indirect ownership interest in the applicant greater than three percent and of each subsidiary or division of the applicant;

(4) If the applicant is not a permanent resident of the United States, include a designation of a permanent

resident of the United States as his agent for service of process in accordance with § 107.7 of this title;

(5) Set forth a detailed description of the inspection and testing facilities to be used by the applicant and the applicant's capability to perform the inspections and verify the tests required by Part 178 of this subchapter;

(6) Identify by name each individual whom the applicant proposes to employ as an inspector responsible for certifying inspection and test results and a statement of that person's qualifications; and

(7) Specify the identification or qualification number assigned to each inspector who is supervised by a certifying inspector identified in § 173.300a(b)(6).

(c) Upon the request of the Director, OHMT the applicant shall allow the Director to inspect the applicant's inspection and testing facilities. In the case of inspection and testing facilities located outside the United States, the applicant shall bear the cost of the inspection.

(d) If, on the basis of information submitted in the application and his own investigation, the Director, OHMT finds that the applicant is qualified to perform the inspections and verifications required by Part 178 of this subchapter for cylinders to be used in the transportation of hazardous materials, he issues an approval subject to such terms and conditions as he considers necessary.

(e) The Director, OHMT will issue an approval as an independent inspection agency for the purpose of performing inspections and verifications within the United States to any competent and disinterested inspector of cylinders so designated by the Bureau of Explosives before May 1, 1976, who submits a copy of that designation by July 15, 1976, together with the name, the assigned identification or qualification number, and a statement of the qualifications of each person employed as an inspector under that designation to: Office of Hazardous Materials Transportation, U.S. Department of Transportation, Washington, D.C. 20590.

(f) Notwithstanding any requirement of this subchapter to the contrary, between May 30, 1976, and August 15, 1976, inspections and verifications required by Part 178 of this subchapter may be performed within the United States by any competent and disinterested inspector so designated by the Bureau of Explosives prior to May 1, 1976.

(g) An approval issued under this section is not transferable and is effective until surrendered or withdrawn or otherwise terminated by the Director, OHMT.

(h) The holder of an approval issued under this section shall notify the Director, OHMT within 20 days after the date there is any change in the information submitted in the application for the approval.

(i) Upon the request of the Director, OHMT the holder of an approval issued under this section shall allow the Director to inspect the holder's inspection and testing facilities and shall make available for inspection the holder's records pertaining to inspections and verifications required by Part 178 of this subchapter. In the case of inspection and testing facilities located outside the United States and records made available for inspection outside the United States, the holder shall bear the costs of inspection.

[Amdt. 173-97, 41 FR 18414, May 4, 1976, as amended by Amdt. 173-142, 45 FR 81572, Dec. 11, 1980; Amdt. 173-158, 47 FR 43065, Sept. 30, 1982]

§ 173.300b Approval of non-domestic chemical analyses and tests.

(a) Any person who manufactures cylinders outside the United States may apply to the Department for approval to have the chemical analyses and tests of those cylinders required by Part 178 of this subchapter performed outside the United States for the purpose of qualifying them for use in the transportation of hazardous materials to, from or within the United States.

(b) Each application filed under this section for approval to perform chemical analyses and tests of cylinders outside the United States must:

(1) Be submitted in writing to: Office of Hazardous Materials Transporta-

tion, U.S. Department of Transportation, Washington, D.C. 20590;

(2) State the name, address, and telephone number of the applicant and the name, address and a description of each facility at which cylinders are to be manufactured and chemical analyses and tests are to be performed;

(3) If the applicant is not a resident of the United States, include a designation of a permanent resident of the United States as his agent for service of process in accordance with § 107.7 of this title;

(4) Set forth complete details concerning the dimension, materials of construction, wall thickness, water capacity, shape, type of joints, location and size of openings and other pertinent physical characteristics of each specification cylinder for which approval is being requested, including calculations for cylinder wall stress and wall thickness which may be shown on a drawing or on separate sheets attached to a descriptive drawing. If units of weights and measures are expressed in the metric system, they must also be stated in the English system equivalents; and

(5) Identify the independent inspection agency to be used.

(c) Upon the request of the Director, OHMT the applicant shall allow the Director to inspect the applicant's cylinder manufacturing and testing facilities and shall provide such materials and cylinders for analyses and tests as the Director may specify. The applicant shall bear the cost of the inspections, analyses, and tests.

(d) If, on the basis of the information submitted in the application and his own investigation, the Director, OHMT finds that the applicant has the proper manufacturing equipment and facilities and is otherwise capable of insuring the proper performance of the chemical analyses and tests required by Part 178 of this subchapter for cylinders to be used in the transportation of hazardous materials, he issues an approval, subject to such terms and conditions as he considers necessary.

(e) An approval issued under this section is not transferable and is effective until surrendered or withdrawn or otherwise terminated by the Director, OHMT.

(f) The holder of an approval issued under this section shall notify the Director, OHMT within 20 days after the date there is any change in the information submitted in the application for the approval.

(g) Upon the request of the Director, OHMT the holder of an approval issued under this section shall allow the Director to inspect the holder's cylinder manufacturing and testing facilities, any cylinder manufactured under that approval, the holder's inspection and test records, and technical data files pertaining to any cylinder manufactured under that approval. In the case of facilities located outside the United States, or cylinders, records or files made available for inspection outside the United States, the holder shall bear the costs of inspection.

[Amdt. 173-97, 41 FR 18415, May 4, 1976, as amended by Amdt. 173-142, 45 FR 81572, Dec. 11, 1980; Amdt. 173-158, 47 FR 43065, Sept. 30, 1982]

§ 173.300c Termination of approval.

(a) The Director, OHMT may terminate an approval issued under § 173.300a or § 173.300b of this subpart if he determines:

(1) That information upon which approval was based is fraudulent or substantially erroneous;

(2) That the holder has not complied with Subchapter C of this chapter;

(3) That, in the case of an independent inspection agency, the agency or an employee thereof is or appears to be controlled or improperly influenced by cylinder manufacturing interests;

(4) That the holder is subject to an outstanding final judgment of a Federal court which concerns the enforcement of Subchapter C of this chapter and which has not been satisfied within a reasonable period of time; or

(5) That continuation of the approval is not consistent with the requirements of transportation safety.

(b) The Director, OHMT, before he terminates an approval issued under § 173.300a or § 173.300b of this subpart, notifies the holder in writing of the reasons therefor and provides the holder an opportunity to show why the approval should not be terminated.

[Amdt. 173-97, 41 FR 18415, May 4, 1976, as amended by Amdt. 173-142, 45 FR 51572, Dec. 11, 1980]

§ 173.301 General requirements for shipment of compressed gases in cylinders.[1]

(a) *Gases capable of combining chemically.* A cylinder charged with compressed gas must not contain gases or materials that are capable of combining chemically with each other or with the cylinder material so as to endanger its serviceability. See § 173.34(e)(16) regarding the requalification of a cylinder that previously contained a corrosive liquid.

(b) *Ownership of container.* A container charged with a compressed gas must not be shipped unless it was charged by or with the consent of the owner of the container.

(c) *Retest of container.* A container for which prescribed periodic retest has become due must not be charged and shipped until such retest has been properly made.

(d) *Manifolding containers in transportation.* No means of interconnecting such as manifolding of individual containers may be employed for the transportation of compressed gases, except as hereinafter authorized. Containers so manifolded shall be supported and held together as a unit by structurally adequate means. Safety relief devices on manifolded horizontal containers charged with flammable compressed gas shall be arranged to discharge upward and unobstructed to the open air in such a manner as to prevent any impingement of escaping gas upon the containers.

(1) Manifolding is authorized for containers of the following gases: argon, air, carbon dioxide, helium, neon, nitrogen, nitrous oxide, oxygen or sulfur hexafluoride provided that each container is individually equipped with pressure relief devices as required by § 173.34(d) or § 173.315(i).

(2) Manifolding is authorized for specification cylinders containing the following nonliquefied gases: boron trifluoride, carbon monoxide, ethylene, hydrogen, hydrocarbon gases, methane, nitrogen trifluoride, and tetrafluoroethylene, inhibited, except that aluminum cylinders are not authorized for boron trifluoride or nitrogen trifluoride service. Individual cylinders must be equipped with approved pressure relief devices as required by § 173.34(d) or § 173.315(i) of this Part. Each cylinder must be equipped with an individual shutoff valve that must be tightly closed while in transit. Manifold branch lines of these individual shutoff valves must be sufficiently flexible to prevent damage to the valves which otherwise might result from the use of rigid branch lines. A temperature measuring device may be inserted in one cylinder of a manifold installation in place of the shutoff valve.

(3) Manifolding is authorized for specification cylinders containing the following gases: ethane, ethylene, hydrogen chloride, liquefied hydrocarbon gas, liquefied petroleum gas and propylene, except that aluminum cylinders are not authorized for hydrogen chloride service, provided each cylinder is equipped with approved pressure relief devices as required by § 173.34(d) or § 173.315(i) of this part: *and provided further,* that each cylinder is equipped with an individual shutoff valve that must be tightly closed while in transit. Each cylinder must be separately charged and means must be provided to insure that no interchange of cylinder contents can occur during transportation. Manifold branch lines to these individual shutoff valves must be sufficiently flexible to prevent injury to the valves which otherwise might result from the use of rigid branch lines.

(4) Manifolding is authorized for containers of acetylene, provided that each container is individually equipped with approved safety relief devices as required by § 173.34(d): *And further provided,* That each container is equipped with an individual shutoff valve, or valves, which shall be tightly closed while in transit. Manifold branch lines to these individual shut-

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[1] Requirements covering cylinders are also applicable to spherical pressure vessels.

off valves shall be sufficiently flexible to prevent injury to the valves which otherwise might result from the use of rigid branch lines. All manifold containers shall be transported in a vertical position. For the checking of tare weights or for replacement of solvent the container shall be removed from the manifold. This requirement is not intended to prohibit the charging of the acetylene cylinders while manifolded.

(5) Manifolding is authorized for cargo tanks of the following gas provided individual cargo tanks are equipped with the safety relief valves and gaging devices, as required by § 173.315(h) and (i): *And further provided*, That each cargo tank is equipped with individual valve, or valves, which shall be tightly closed while in transit and that each such container must be separately charged: Anhydrous ammonia.

(e) *Container pressure*. The pressure in the container at 70° F. must not exceed the service pressure for which the container is marked or designated, except as provided in § 173.302(c).

NOTE 1: In certain cases with liquefied gases the pressure at 70° F. must be lower than the marked service pressure to avoid having a greater pressure at a temperature of 130° F. than is permitted.

(1) For authorized containers not marked with a service pressure, the service pressure is designated as follows:

Specification marking	Service pressure—psig
DOT 3	1,600
3E	1,800
4	300
8	250
9	200
25	300
33	480
38	250
40	200
41	240

(2) For containers made prior to the effective date of specifications, the service pressure is designated as the same as for the same type of container made in accordance with current specifications.

(f) *Container pressure at 130° F*. The pressure in the container at 130° F. shall not exceed 5/4 times the service pressure, except:

(1) Containers charged with acetylene, liquefied nitrous oxide and liquefied carbon dioxide.

(2) When a cylinder is charged in accordance with § 173.302(c), the pressure in the cylinder at 130° F. must not exceed 5/4 times the filling pressure authorized therein.

(g) *Container valve protection*. Containers charged with flammable, corrosive, or noxious gases, must have their valves protected by one of the following methods.

(1) By equipping the containers with securely attached metal caps of sufficient strength to protect the valves from injury during transit.

(2) By boxing or crating the containers so as to give proper protection to the valves.

(3) By so constructing the containers that the valve is recessed into the container or otherwise protected so that it will not be subjected to a blow when the container is dropped on a flat surface.

(4) By loading the containers compactly in an upright position and securely bracing in cars or motor vehicles, when loaded by the consignor and to be unloaded by the consignee.

(5) By equipping with valves strong enough to avoid injury during transit for containers containing non-liquefied gas under pressure not exceeding 300 psi at 70° F.

(h) *Compressed gas containers*. Compressed gases must be in metal containers built in accordance with the DOT specifications, as shown below, in effect at the time of manufacture, and marked as required by the specification and the regulation for retesting if applicable;

PACKAGINGS

DOT-2P	DOT-3D	DOT-4BW	DOT-8AL
2Q	3E	4B240ET	9.[1]

PACKAGINGS—Continued

ICC-3[1]	3HT	4C	ICC-25[1]
DOT-3A	DOT-3T	4D	26[1]
DOT-3AL			
DOT-3AX	4	4DA	33[1]
3A480X	4A	4DS	38[1]
3AA	4AA	4E	DOT-39
DOT-3AAX	4B	4L	40[1]
3B	4B240FLW	5	41[1]
3BN	4B240X[1]	5F	
3C	4BA	8	

[1] Use of existing cylinders authorized, but new construction not authorized.

(i) *Foreign cylinders in domestic use.* Except as provided in paragraph (j) of this section, a charged cylinder manufactured outside the United States may not be offered for transportation to, from, or within the United States unless it has been manufactured, inspected, and tested in accordance with the applicable DOT specification set forth in Part 178 of this subchapter.

(j) *Charging of foreign cylinders for export.* Unless it has been manufactured, inspected, and tested in accordance with the applicable DOT specification set forth in Part 178 of this subchapter, a cylinder manufactured outside the United States and received in the United States for charging with compressed gas may be charged and shipped for export only.

(1) Provided that they are retested in accordance with § 173.34(e). This retest may be omitted only if the container can be definitely identified as having been retested under this provision within the prescribed retest period, and

(2) Provided further that the maximum filling density and service pressure for each container shall be in accordance with all packing requirements of this part for the compressed gas involved.

(3) Records showing the results of the tests made on all foreign containers must be preserved for inspection until the next scheduled retest date.

(4) Bill of lading or other shipping paper shall, when possible, identify the containers and shall carry the following certification: "These containers have been retested and refilled in accordance with the DOT requirements for export"

(k) *Outside packagings.* Specification 2P, 2Q, 3E, 3HT, 4BA spherical type, 4D, 4DA, 4DS, 9[1], 39, 40[1], and 41[1] must be shipped in strong outside packagings, except that the 4BA spherical type may be securely mounted on pallets to provide protection for the spheres and any attachments.

(1) Outside packagings must provide protection for the complete cylinder and against accidental functioning of and damage to valves under conditions normally incident to transportation.

(l) Specifications 3AX, 3AAX, and 3T cylinders are authorized for transportation only when horizontally mounted on a motor vehicle and when valves and safety devices are protected, as follows:

(1) Each cylinder must be fixed at one end of the vehicle with provision for thermal expansion at the opposite end attachment.

(2) The valve and safety relief device protective structure must be sufficiently strong to withstand a force equal to twice the weight involved with a safety factor of four, based on the ultimate strength of the material used; and

(3) Each discharge for a safety relief device on a cylinder containing a flammable gas must be upward and unobstructed.

[29 FR 18743, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.301, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

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[1] Use of existing cylinders authorized, but new construction not authorized.

§ 173.302 Charging of cylinders with nonliquefied compressed gases.

(a) *Detailed requirements.* Nonliquefied compressed gases (except gas in solution or poisonous gas) for which charging requirements are not definitely prescribed in § 173.304(a)(2) must be shipped, subject to § 173.301, and § 173.305 in specification containers as follows:

(1) Specification 3,[1] 3A, 3AA, 3B, 3C,[1] 3D,[1] 3E, 4,[1] 4A,[1] 4B, 4BA, 4BW, 4C,[1] 25,[1] 26,[1] 33,[1] or 38,[1] (§§ 178.36, 178.37, 178.38, 178.42, 178.50, 178.51, 178.61 of this subchapter). See §§ 173.34 and 173.301(e).).

NOTE 1: Authorized cylinders containing oxygen which is continuously fed to tanks containing live fish may be shipped irrespective of the provisions of § 173.24.

(2) Specification 3HT (§ 178.44 of this subchapter) cylinders for aircraft use only, having a maximum service life of 24 years. Authorized only for nonflammable gases. Cylinders must be equipped with safety relief devices only of the frangible disc type which meet the requirements of § 173.34(d). Each frangible disc must have a rated bursting pressure which does not exceed 90 percent of the minimum required test pressure of the cylinder. Discs with fusible metal backing are not permitted. Spec. 3HT cylinders may be shipped only when packed in strong outside packagings.

(3) Specification 3AX, 3AAX, or 3T (§§ 178.36, 178.37, 178.45 of this subchapter) cylinders are authorized only for the following nonliquefied gases: Air, argon, boron trifluoride, carbon monoxide, ethane, ethylene, helium, hydrogen, methane, neon, nitrogen, or oxygen, except that specification 3T is not authorized for hydrogen. As used in this paragraph methane is a nonliquefied gas which has a minimum purity of 98.0 percent methane and which is commerically free of corroding components.

(4) Specification 39 (§ 178.65 of this subchapter) cylinder. For flammable gases, internal volume may not exceed 75 cubic inches. Aluminum cylinders are authorized for oxygen only under the following conditions:

(i) Cylinder threads must be straight threads;

(ii) Cylinder must be equipped only with brass or stainless steel valve; and

(iii) Each cylinder must be cleaned in compliance with the requirements of Federal Specification RR-C-901b, dated August 1, 1967, paragraphs 3.7.2 and 3.8.2. Cleaning agents equivalent to those specified in RR-C-901b, may be used; however any cleaning agent must not be capable of reacting with oxygen. One cylinder selected at random from a group of 200 or less cleaned at the same time, must be tested for oil contamination in accordance with specification RR-C-901b paragraph 4.4.2.3 and meet the standard of cleanliness specified.

(5) Specification 3AL (§ 178.46 of this subchapter) cylinders are authorized only for the following nonliquefied gases: air, argon, carbon monoxide, diborane, ethylene, helium, mercury free hydrogen, krypton, methane, nitrogen, neon, oxygen and xenon. Flammable gases shipped in 3AL cylinders are authorized only when transported by highway, rail and cargo-only aircraft. When used in oxygen service, aluminum cylinders must be in compliance with the following conditions:

(i) Cylinder must be equipped only with brass or stainless steel valve;

(ii) Cylinder must have only straight threads in the opening;

(iii) Each cylinder must be cleaned in compliance with the requirements of Federal Specification RR-C-901b, dated August 1, 1967, paragraphs 3.7.2, and 3.8.2. Cleaning agents equivalent to those specified in RR-C-901b may be used; however, any cleaning agent must not be capable of reacting with oxygen. One cylinder selected at random from a group of 200 or less, cleaned at the same time, must be tested for oil contamination in accordance with Specification RR-C-901b, paragraph 4.4.2.3, and meet the standard of cleanliness specified; and

(iv) Cylinder must have a marked service pressure not exceeding 3000 psi.

(b) *Filling limits.* (See § 173.301(e).)

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[1] Use of existing cylinders authorized, but new construction not authorized.

(c) *Special filling limits for Specifications 3A, 3AX, 3AA, 3AAX, and 3T cylinders.* Specifications 3A, 3AX, 3AA, 3AAX, and 3T (§§ 178.36, 178.37, 178.45 of this subchapter) cylinders may be charged with compresed gases, other than liquefied, dissolved, poisonous, or flammable gases to a pressure 10 percent in excess of their marked service pressure, provided:

(1) That such cylinders are equipped with frangible disc safety relief devices (without fusible metal backing) having a bursting pressure not exceeding the minimum prescribed test pressure.

(2) That the elastic expansion shall have been determined at the time of the last test or retest by the water jacket method.

(3) That either the average wall stress or the maximum wall stress shall not exceed the wall stress limitation shown in the following table (see Notes 1 and 2):

Type of steel	Average wall stress limitation	Maximum wall stress limitation
Plain carbon steels over 0.35 carbon and medium manganese steels	53,000	58,000
Steels of analysis and heat-treatment specified in spec. 3AA	67,000	73,000
Steel of analysis and heat treatment specified in Spec. DOT-3T	87,000	94,000
Plain carbon steels less than 0.35 carbon made prior to 1920	45,000	48,000

NOTE 1: The average wall stress shall be computed from the elastic expansion data using the following formula:

$$S=1.7EE/KV-0.4P$$

where:

S = wall stress, pounds per square inch;
EE = elastic expansion (total less permanent) in cubic centimeters;
K = factor × 10^{-7} experimentally determined for the particular type of cylinder being tested;
V = internal volume in cubic centimeter (1 cubic inch = 16.387 cubic centimeters);
P = test pressure, pounds per square inch.

Formula derived from formula of Note 2 and the following:

$$EE=(PKVD^2)/(D^2-d^2)$$

NOTE 2: The maximum wall stress shall be computed from the formula:

$$S=(P(1.3D^2+0.4d^2))/(D^2-d^2)$$

where:

S = wall stress, pounds per square inch;
P = test pressure, pounds per square inch;
D = outside diameter, inches;
d = $D-2t$, where t = minimum wall thickness determined by a suitable method

(4) That an external and internal visual examination made at the time of test or retest shows the cylinder to be free from excessive corrosion, pitting, or dangerous defects.

(5) That a plus sign (+) be added following the test date marking on the cylinder to indicate compliance with paragraphs (c) (2), (3), and (4) of this section.

(d) *Fluorine.* Fluorine must be shipped in Specification 3A1000, 3AA1000, or 3BN400 (§ 178.36, § 178.37 or § 178.39 of this subchapter) cylinders without safety relief device and equipped with valve protection cap. Such containers must not be charged to over 400 p.s.i.g. at 70° F. and must not contain over 6 pounds of gas.

(e) *Verification of container pressure.* (1) Each day, the pressure in a container representative of that day's compression must be checked by the charging plant after the container has cooled to a settled temperature and a record of this test kept for at least 30 days.

(f) *Carbon monoxide.* Carbon monoxide must be shipped in a Specification 3A, 3AX, 3AA, 3AAX, 3AL, 3, 3E, or 3T, (§§ 178.36, 178.37, 178.46, 178.42, 178.45 of this subchapter) cylinder having a minimum service pressure of 1,800 psig. The pressure in the cylinder must not exceed 1000 psig at 70° F. except that if the gas is dry and sulfur free, the cylinder may be charged to five-sixths of the cylinder service pressure or 2000 psig, whichever is the lesser. Specification 3AL cylinders are authorized only when transported by highway, rail and cargo-only aircraft.

(g) *Diborane and diborane mixtures.* Diborane and diborane mixed with compatible compressed gas in Specification 3AA1800 (§ 178.37 of this subchapter), cylinders. The maximum filling density of the diborane shall not exceed 7 percent. Diborane mixed with compatible compressed gas must not have a pressure exceeding the service pressure of the cylinder if complete decomposition of the diborane occurs. Cylinder valves must be protected either by metal caps or by over packing cylinder in strong wooden boxes.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53(e), App. A to Part 1)

[29 FR 18743, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.302, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.303 Charging of cylinders with compressed gas in solution (acetylene).

(a) *Cylinder, filler and solvent requirements.* (Refer to applicable parts of Specification 8 and 8AL). Acetylene gas must be shipped in Specification 8 or 8AL (§ 178.59 or § 178.60 of this subchapter) cylinders. The cylinders shall consist of metal shells filled with a porous material, and this material must be charged with a suitable solvent. The cylinders containing the porous material and solvent, shall be tested with satisfactory results in accordance with CGA Pamphlet C-12. Representative samples of cylinders charged with acetylene shall be tested with satisfactory results in accordance with CGA Pamphlet C-12.

(1) The specific gravity of acetone solvent in acetylene cylinders must be 0.796 or over at 15.5° C. (59.9° F.).

(2) The amount of solvent added in the refilling operation must not cause the tare weight of the cylinder to exceed its marked tare weight. The tare weight includes the weight of the cylinder shell, porous filling, valve, safety relief devices and solvent, but without removable cap.

(b) *Filling limits.* The pressure in cylinders containing acetylene gas must not exceed 250 psi at 70° F., and in case the cylinders are marked for a lower allowable charging pressure, at 70° F., then that pressure must not be exceeded.

(c) *Data requirements on filler and solvent.* Cylinders containing acetylene gas must not be shipped unless they were charged by or with the consent of the owner, and by a person, firm, or company having possession of complete information as to the nature of the porous filling, the kind and quantity of solvent in the cylinders, and the meaning of such markings on the cylinders as are prescribed by the Department's regulations and specifications applying to containers for the transportation of acetylene gas.

(d) *Verification of container pressure.* (1) Each day, the pressure in a container representative of that day's compression must be checked by the charging plant after the container has cooled to a settled temperature and a record of this test kept for at least 30 days.

[29 FR 18743, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.303, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.304 Charging of cylinders with liquefied compressed gas.

(a) *Detailed charging requirements.* Liquefied gases shall be charged in accordance with the specific provisions of paragraph (a)(2) of this section or paragraph (e) of this section. Where charging requirements are not specifically prescribed, liquefied gases, except gas in solution or poisonous gas, must be shipped, subject to the applicable paragraphs under General Requirements for Shipment (see § 173.301), the charging requirements of this section for liquefied compressed gas, or the charging requirements for mixtures (see § 173.305), in containers manufactured under specifications, as follows:

(1) Specification 3,[1] 3A, 3AA, 3B, 3BN, 3D[1] 3E, 4,[1] 4A,[1] 4B, 4BA, 4B240ET, 4BW, 4E, 9,[1] 25,[1] 26,[1] 38,[1] 39, 40,[1] or 41,[1] (§§ 178.36, 178.37, 178.38, 178.39, 178.42, 178.50, 178.51, 178.55, 178.61, 178.65, 178.68 of this subchapter), except that no Specification 4E, 9, 39, 40, 41 packaging may be charged and shipped with a mixture containing a pyroforic liquid, carbon bisulfide (disulfide), ethyl chloride, ethylene oxide, nickel carbonyl, spirits of nitroglycerin, or poisonous material (class A, B, or irritating material), unless specifically authorized in this part.

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[1] Use of existing cylinders authorized, but new construction not authorized.

(2) The following requirements must be complied with for the gases named (for cryogenic liquids, see § 173.316):

Kind of gas	Maximum permitted filling density (percent) (see Note 1)	Containers marked as shown in this column or of the same type with higher service pressure must be used except as provided in § 173.34 (a), (b), § 173.301(j) (see notes following table)
Anhydrous ammonia	54	DOT-4; DOT-3A480; DOT-3AA480; DOT-3A480X; DOT-4A480; DOT-3; DOT-4AA480; DOT-3E1800; DOT-3AL480.
Bromotrifluoromethane (R-13B1 or H-1301).	124	DOT-3A400; DOT-3AA400; DOT-3B400; DOT-4A400; DOT-4AA480; DOT-4B400; DOT-4BW400; DOT-3E1800; DOT-39; DOT-3AL400.
Carbon dioxide (see Notes 4, 7, and 8)	68	DOT-3A1800; DOT-3AX1800; DOT-3AA1800; DOT-3AAX1800; DOT-3; DOT-3E1800; DOT-3T1800; DOT-3HT2000; DOT-39.
Carbon dioxide, nitrous oxide mixture (see Notes 7, and 8).	68	DOT-3A1800; DOT-3AX1800; DOT-3AA1800; DOT-3AAX1800; DOT-3; DOT-3E1800; DOT-3T1800; DOT-3HT2000; DOT-39; DOT-3AL1800.
Chlorine (see Note 2)	125	DOT-3A480; DOT-3AA480; DOT-25; DOT-3; DOT-3BN480; DOT-3E1800.
Chlorodifluroethane (R-142b) *or* 1-chloro-1, 1-difluoroethane (see Note 8).	100	DOT-3A150; DOT-3AA150; DOT-3B150; DOT-4B150; DOT-4BA225; DOT-4BW225; DOT-3E1800; DOT-39, DOT-3AL150.
Chlorodifluoromethane (R-22) (see Note 8).	105	DOT-3A240; DOT-3AA240; DOT-3B240; DOT-4B240; DOT-4BA240; DOT-4BW240; DOT-4B240ET; DOT-4E240; DOT-39; DOT-41; DOT-3E1800; and DOT-3ALA240.
Chloropentafluorethane, (R-115)	110	DOT-3A225; DOT-3AA225; DOT-3B225; DOT-4A225; DOT-4BA225; DOT-4B225; DOT-4BW225; DOT-3E1800; DOT-39; and DOT-3AL225.
Chlorotrifluoromethane (R-13) (see Note 8).	100	DOT-3A1800; DOT-3AA1800; DOT-3; DOT-3E1800; DOT-39; and DOT-3AL1800.
Cyclopropane (see Notes 8 and 9)	55	DOT-3A225; DOT-3A480X; DOT-3AA225; DOT-3B225; DOT-4A225; DOT-4AA480; DOT-4B225; DOT-4BA225; DOT-4BW225; DOT-4B240ET; DOT-3; DOT-3E1800; DOT-39; and DOT-3AL225.
Dichlorodifluoromethane (R-12) (see Note 8).	119	DOT-3A225; DOT-3AA225; DOT-3B225; DOT-4A225; DOT-4B225; DOT-4BA225; DOT-4BW225; DOT-4B240ET; DOT-4E225; DOT-9; DOT-39; DOT-41; DOT-3E1800; and DOT-3AL225.
Dichlorodifluoromethane and difluoroethane mixture (constant boiling mixture) (R-500) (see Note 8).	Not liquid full at 130° F.	DOT-3A240; DOT-3AA240, DOT-3B240; DOT-3E1800; DOT-4A240; DOT-4B240; DOT-4BA240; DOT-4BW240; DOT-4E240; DOT-9, DOT-39.
Difluoroethane (R-152a) (see Note 8)	79	DOT-3A150; DOT-3AA150; DOT-3B150; DOT-4B150; DOT-4BA225; DOT-4BW225; DOT-3E1800; DOT-3AL150.
Dimethylamine, anhydrous	59	DOT-3A150; DOT-3AA150; DOT-3B150; DOT-4B150 DOT-4BA225; DOT-4BW225; ICC-3E1800.
Ethane (see Notes 8 and 9)	35.8	DOT-3A1800; DOT-3AX1800; DOT-3AA1800; DOT-3AAX1800; DOT-3; DOT-3E1800; DOT-3T1800; DOT-39; DOT-3AL1800.
Ethane (see Notes 8 and 9)	36.8	DOT-3A2000; DOT-3AX2000; DOT-3AA2000; DOT-3AAX2000; DOT-3T2000; DOT-39; DOT-3AL2000.
Ethylene (see Notes 8 and 9)	31.0	DOT-3A1800; DOT-3AX1800 DOT-3AA1800; DOT-3AAX1800; DOT-3; DOT-3E1800; DOT-3T1800; DOT-39; and DOT-3AL1800 .
Ethylene (see Notes 8 and 9)	32.5	DOT-3A2000; DOT-3AX2000; DOT-3AA2000; DOT-3AAX2000; DOT-3T2000; DOT-39; and DOT-3AL2000.
Ethylene (see Notes 8 and 9)	35.5	DOT-3A2400; DOT-3AX2400; DOT-3AA2400; DOT 3AAX2400; DOT-3T2400; DOT-39; DOT-3AL2400.
Hydrogen chloride	65	DOT-3A1800; DOT-3AA1800, DOT-3AX1800; DOT-3AAX1800; DOT-3; DOT-3T1800; DOT-3E1800.
Hydrogen sulfide (see Note 10)	62.5	DOT-3A480; DOT-3AA480; DOT-3B480; DOT-4A480; DOT-4B480; DOT-4BA480; DOT-4BW480.; DOT-26-480; DOT-3E1800; DOT-3AL480.
Insecticide, liquefied gas (see Note 8)	Not liquid full at 130° F	DOT-3A300; DOT-3AA300; DOT-3B300, DOT-4B300; DOT-4BA300; DOT-4BW300; DOT-9; DOT-40; DOT-41 DOT-3E1800.

Kind of gas	Maximum permitted filling density (percent) (see Note 1)	Containers marked as shown in this column or of the same type with higher service pressure must be used except as provided in § 173.34 (a), (b), § 173.301(j) (see notes following table)
Liquefied nonflammable gases, liquid other than those classified as flammable, corrosive, or poisonous, and mixtures or solutions thereof, charged with nitrogen, carbon dioxide, or air (see Notes 7 and 8).	Not liquid full at 130° F	Specification packaging authorized in paragraph (a)(1) of this section and DOT-3HT; DOT 4D; DOT-4DA; DOT-4DS.
Methylacetylene-propadiene, stabilized (see Note 5).	Not liquid full at 130° F	DOT-4B240 without brazed seams; DOT-4BA240 without brazed seams; DOT-3A240; DOT-3AA240; DOT-3B240; DOT-3E1800; DOT-4BW240; DOT-4E240; DOT-4B240ET; DOT-4; DOT-41; DOT-3AL240.
Methyl chloride	84	DOT-3A225; DOT-3AA225; DOT-3B225; DOT-4A225; DOT-4B225; DOT-4BA225; DOT-4BW225; DOT-3; DOT-4; DOT-25; DOT-26-300; DOT-38; DOT-3E1800; DOT-4B240ET. Cylinders complying with DOT-3A150; DOT-3B150; DOT-4A150, and DOT-4B150 manufactured prior to Dec. 7, 1936 are also authorized.
Methyl mercaptan	80	DOT-3A240; DOT-3AA240; DOT-3B240; DOT-4B240; DOT-4B240ET; DOT-3E1800; DOT-4BA240; DOT-4BW240.
Monomethylamine, anhydrous	60	DOT-3A150; DOT-3AA150; DOT-3B150; DOT-4B150; DOT-4BA225; DOT-4BW225; DOT-3E1800.
Nitrosyl chloride	110	DOT-3BN400 only.
Nitrous oxide (see Notes 7, 8, and 11)	68	DOT-3A1800; DOT-3AX1800; DOT-3AA1800; DOT-3AAX1800; DOT-3; DOT-3E1800; DOT-3T1800; DOT-3HT2000; DOT-39; DOT-3AL1800.
Refrigerant gas, n.o.s. or Dispersant gas, n.o.s.(see Note 8).	Not liquid full at 130° F	DOT-3A240; DOT-3AA240; DOT-3B240; DOT-3E1800; DOT-4A240; DOT-4B240; DOT-4BA240; DOT-4BW240; DOT-4E240; DOT-9; DOT-39; and DOT-3AL240.
Sulfur dioxide (see Note 8)	125	DOT-3A225; DOT-3AA225; DOT-3B225; DOT-4A225; DOT-4B225; DOT-4BA225; DOT-4B240ET; DOT-3; DOT-4; DOT-25; DOT-26-150; DOT-38; DOT-39; DOT-3E1800; and DOT-3AL225.
Sulfur hexafluoride	120	DOT-3A1000; DOT-3AA1000; DOT-3AAX2400; DOT-3; DOT-3AL1000; DOT-3E1800; DOT-3T1800.
Sulfuryl fluoride	106	DOT-3A480; DOT-3AA480; DOT-3E1800; DOT-4B480; DOT-4BA480; DOT-4BW480.
Tetrafluoroethylene, inhibited	90	DOT-3A1200; DOT-3AA1200; DOT-3E1800.
Trifluorochloroethylene	115	DOT-3A300; DOT-3AA300; DOT-3B300; DOT-4A300; DOT-4B300; DOT-4BA300; DOT-4BW300; DOT-3E1800.
Trimethylamine, anhydrous	57	DOT-3A150; DOT-3AA150; DOT-3B150; DOT-4B150; DOT-4BA225; DOT-4BW225; DOT-3E1800.
Vinyl chloride (see Note 5)	84	DOT-4B150 without brazed seams; DOT-4BA225 without brazed seams; DOT-4BW225; DOT-3A150; DOT-3AA150; DOT-25; DOT-3E1800; DOT-3AL150.
Vinyl fluoride, inhibited	62	DOT-3A1800; DOT-3AA1800; DOT-3E1800; DOT-3AL1800.
Vinyl methyl ether (see Note 5)	68	DOT-4B150, without brazed seams; DOT-4BA225 without brazed seams; DOT-4BW225; DOT-3A150; DOT-3AA150; DOT-3B150; DOT-25; DOT-3E1800.

NOTE 1: The "filling density" is hereby defined as the percent ratio of the weight of gas in a container to the weight of water that the container will hold at 60° F. (1 lb. of water = 27.737 cubic inches at 60° F.).

NOTE 2: Cylinders purchased after Oct. 1, 1944, for the transportation of chlorine must contain no aperture other than that provided in the neck of the cylinder for attachment of a valve equipped with an approved safety relief device. Cylinders purchased after Nov. 1, 1935, and charged with chlorine must not contain over 150 pounds of gas.

NOTE 3: [Reserved]

NOTE 4: Special carbon dioxide mining devices containing a heating element and charged with not over 6 pounds of carbon dioxide may be filled to a density of not over 85 percent, provided the cylinder is made of steel with a calculated bursting pressure in excess of 39,000 psi, be fitted with a frangible disc that will operate at not over 57 percent of that pressure, and be able to withstand a drop of 10 feet when striking crosswise on a steel rail while under a pressure of at least 3,000 psi. Such devices must be shipped in strong boxes or must be wrapped in heavy burlap and bound by 12-gauge wire with the wire completely covered by friction tape. Wrapping must be applied so as not to interfere with the functioning of the frangible disc safety relief device. Shipments must be described as "liquefied carbon dioxide gas (mining device)" and marked, labeled, and certified as prescribed for liquefied carbon dioxide.

NOTE 5: All parts of valve and safety relief devices in contact with contents of cylinders must be of a metal or other material, suitably treated if necessary, which will not cause formation of any acetylides.

NOTE 6: [Reserved]

NOTE 7: Specification 3HT cylinders for aircraft use only, having a maximum service life of 24 years. Authorized only for nonflammable gases. Cylinders must be equipped with pressure relief devices only of the frangible disc type which meet the requirements of § 173.34(d). Each frangible disc must have a rated bursting pressure which does not exceed 90 percent of the minimum required test pressure of the cylinder. Discs with fusible metal backing are not permitted. Cylinders may be shipped only when packed in strong outside packagings.

NOTE 8 See § 173.301(k).

NOTE 9. When used for shipment of flammable gases, the internal volume of a specification 39 cylinder must not exceed 75 cubic inches.

NOTE 10: Each valve outlet must be sealed by a threaded cap or a threaded solid plug.

NOTE 11 See § 173.304(a)(4).

(3) Specification 3AL (§ 178.46 of this subchapter) cylinders are authorized also for the following liquefied gases: cyclobutane, hydrogen selenide, propylene, silane, carbonyl sulfide, bromochlorodifluoromethane, vinyl bromide, and dimethyl ether. Shipments of flammable gases are authorized only when transported by highway, rail and cargo-only aircraft.

(4) Specification DOT 3AL (§ 178.46 of this subchapter) cylinders when used in nitrous oxide service must be in compliance without following conditions:

(i) Cylinder must be equipped only with brass or stainless steel valve; and

(ii) Each cylinder must be cleaned in compliance with the requirements of Federal Specification RR-C-901b paragraphs 3.7.2 and 3.8.2. Cleaning agents equivalent to those specified in RR-C-901b may be used; however, any cleaning agent must not be capable of reacting with oxygen. One cylinder selected at random from a group of 200 or less cleaned at the same time must be tested for oil contamination in accordance with Specification RR-C-901b paragraph 4.4.2.3 and meet the standard of cleanliness specified.

(b) *Filling limits.* Except for carbon dioxide, nitrous oxide and vinyl fluoride, inhibited, the liquid portion of a liquefied gas must not completely fill the packaging at any temperature up to and including 130°F. The liquid portion of vinyl fluoride, inhibited, may completely fill the cylinder at 130°F. provided the pressure at the critical temperature does not exceed one and one-fourth times the service pressure.

(c) *Verification of content in cylinder.* (1) Liquefied gases must be charged by weight, by volume measurement of liquid, charging line, by the use of proper scales or when lower in pressure than required for liquefaction a pressure-temperature chart may be used in charging to insure that the service pressure at 70° F. times 5/4 will not be exceeded at 130° F.

(2) Except as noted in paragraph (d)(4) of this section, the amount of liquefied gas charged into a container must be determined by weight, or if charged at a pressure lower than the liquefaction point, by pressure shown on a chart for the specific gas. Weight must be checked, after disconnecting from the charging line, by the use of proper scales.

(d) *Requirements for liquefied petroleum gas.* (1) Filling density limited as follows:

Minimum specific gravity of the liquid material at 60° F.	Maximum filling density in percent of the water-weight capacity of the container
0.271 to 0.289	26
0.290 to 0.306	27
0.307 to 0.322	28
0.323 to 0.338	29
0.339 to 0.354	30
0.355 to 0.371	31
0.372 to 0.398	32
0.399 to 0.425	33
0.426 to 0.440	34
0.441 to 0.452	35
0.453 to 0.462	36
0.463 to 0.472	37
0.473 to 0.480	38
0.481 to 0.488	39
0.489 to 0.495	40
0.496 to 0.503	41
0.504 to 0.510	42
0.511 to 0.519	43
0.520 to 0.527	44
0.528 to 0.536	45
0.537 to 0.544	46
0.545 to 0.552	47
0.553 to 0.560	48
0.561 to 0.568	49
0.569 to 0.576	50
0.577 to 0.584	51
0.585 to 0.592	52
0.593 to 0.600	53
0.601 to 0.608	54
0.609 to 0.617	55
0.618 to 0.626	56
0.627 to 0.634	57

(2) Subject to § 173.301(f), any filling density percentage prescribed in this section is authorized to be increased by 2 for liquefied petroleum gas in Spec. 26 or 3 cylinders or in Spec. 3A

marked for 1,800 psig, or higher, service pressure.

(3) Liquefied petroleum gas must be shipped in specification containers as follows:

(i) Specification 3,[1] 3A, 3AA, 3B, 3E, 3AL, 4B, 4BA, 4B240FLW, 4B240ET, 4BW, 4B240X,[1] 4E, 4,[1] 4A,[1] 9,[1] 25,[1] 26,[1] 38,[1] 39, or 41[1] (§§ 178.36, 178.37, 178.38, 178.42, 178.46, 178.50, 178.51, 178.54, 178.55, 178.61, 178.65, 178.68 of this subchapter) cylinders. The internal volume of a Specification 39 cylinder must not exceed 75 cubic inches. Shipments of flammable gases in 3AL cylinders are authorized only when transported by highway, rail and cargo-only aircraft

NOTE 1: Cylinders marked as complying with DOT Spec. 4B240FLW bearing manufacturer's symbol WCO and serial numbers 47A-1 to 47A-59200, inclusive, varying from the specification requirements as to physical properties of steel, are authorized for the transportation of liquefied petroleum gases.

(ii) Additional containers may be used within the limits of quantity and pressure as follows:

Type of container	Maximum capacity		Maximum charging pressure—p.s.i.g.
	Cubic inches	Gallons	
DOT-2P or DOT-2Q (see Note 1)	31.83		45 p.s.i.g. at 70° F. and 105 p.s.i.g. at 130° F. (see Note 2).
DOT-2P or DOT-2Q (see Note 1)	31.83		35 p.s.i.g. at 70° F. and 100 p.s.i.g. at 130° F.
DOT-3C or DOT-4C	3,881	16 + 5% tolerance	145 p.s.i.g. at 130° F.

NOTE 1: Containers must be packed in strong wooden or fiber boxes of such design as to protect valves from injury or accidental functioning under conditions incident to transportation. Each completed container filled for shipment must have been heated until contents reached a minimum temperature of 130° F., without evidence of leakage, distortion, or other defect. Each outside shipping container must be plainly marked "INSIDE CONTAINERS COMPLY WITH PRESCRIBED SPECIFICATIONS."

NOTE 2: Containers must be equipped with safety relief devices which will prevent rupture of the containers and dangerous projection of the closing devices when the containers are exposed to the action of fire.

(4) Verification of content. Containers with a water capacity of 200 pounds or more and for use with a liquefied petroleum gas with a specific gravity at 60° F. of 0.504 or greater may have their contents determined by using a fixed length dip tube gauging device. The length of the dip tube shall be such that when a liquefied petroleum gas with a specific volume of 0.03051 cu. ft./lb. at a temperature of 40° F. is charged into the container it just reaches the bottom of the tube. The weight of this liquid shall not exceed 42 percent of the water capacity of the container which must be stamped thereon. The length of the dip tube, expressed in inches carried out to one decimal place and prefixed with the letters "DT" shall be stamped on the container and on the exterior of removable type dip tube; for the purpose of this requirement the marked length shall be expressed as the distance measured along the axis of a straight tube from the top of the boss through which the tube is inserted to the proper level of the liquid in the container. The length of each dip tube shall be checked when installed by weighing each container after filling except when installed in groups of substantially identical containers in which case one of each 25 containers shall be weighed. The quantity of liquefied gas in each container must be checked by means of the dip tube after disconnecting from the charging line. The outlet from the dip tube shall be not larger than a No. 54 drill size orifice. A container representative of each day's filling at each charging plant shall have its contents

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[1] Use of existing cylinders authorized, but new construction not authorized.

checked by weighing after disconnecting from the charging line.

(e) *Refrigerant gases.* Refrigerant gases which are nonpoisonous and nonflammable under this part, must be shipped in cylinders as prescribed in paragraph (a) (1) or (2) of this section, or as follows:

(1) Specifications 2P and 2Q (§§ 178.33, 178.33a of this subchapter). Inside metal containers packed in a strong wooden or fiberboard box of such design as to protect valves from injury or accidental functioning under conditions incident to transportation. Pressure in the container must not exceed 85 pounds per square inch absolute at 70° F. Each completed metal container filled for shipment must be heated until content reaches a minimum temperature of 130° F. without evidence of leakage, distortion, or other defect. Each outside shipping container must be plainly marked "Inside Containers Comply With Prescribed Specification."

(f) *Engine starting fluid.* Engine starting fluid containing compressed gas or gases which are flammable under this part must be shipped in cylinders as prescribed in paragraph (a)(1) of this section, or as follows:

(1) Inside nonrefillable metal containers having a capacity not over 32 cubic inches. Containers must be packaged in Spec. 12B (§ 178.205 of this subchapter) fiberboard boxes equipped with top and bottom pads which will provide three complete thicknesses of fiberboard on top and bottom of each box, or Spec. 15A, 15B, 15C, 19A, or 19B (§§ 178.168, 178.169, 178.170, 178.190, 178.191 of this subchapter) wooden boxes. Pressure in the container must not exceed 140 psi, absolute, at 130° F. However, if the pressure exceeds 140 psi, absolute at 130° F., a Spec. 2P (§ 178.33 of this subchapter) container must be used. In any event, the metal container must be capable of withstanding without bursting a pressure of one and one-half times the pressure of the content at 130° F. The liquid content of the material and gas must not completely fill the container at 130° F. Each completed container filled for shipment must have been heated until content reaches a minimum temperature of 130° F., without evidence of leakage, distortion, or other defect. Each outside shipping container must be plainly marked, "INSIDE CONTAINERS COMPLY WITH PRESCRIBED SPECIFICATIONS."

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[29 FR 18743, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.304, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.305 Charging of cylinders with a mixture of compressed gas and other material.

(a) *Detailed requirements.* A mixture of a compressed gas and any other material must be shipped as a compressed gas if the mixture is a compressed gas as designated in § 173.300(a) and when not in violation of § 173.301(a).

(b) *Filling limits.* (See § 173.301(e).) For mixtures, the liquid portion of the liquefied compressed gas at 130° F. plus any additional liquid or solid must not completely fill the container.

(c) *Nonpoisonous and nonflammable mixtures.* Mixtures containing compressed gas or gases including insecticides, which mixtures are nonpoisonous and nonflammable under this part must be shipped in cylinders as prescribed in § 173.304(a) or as follows:

(1) Specification 2P (§ 178.33 of this subchapter). Inside metal containers equipped with safety relief devices of a type examined by the Bureau of Explosives and approved by the Director, OHMT, and packed in strong wooden or fiber boxes of such design as to protect valves from injury or accidental functioning under conditions incident to transportation. Pressure in the container may not exceed 85 psia at 70°F. Each completed metal container filled for shipment must be heated until content reaches a minimum temperature of 130°F., without evidence of leakage, distortion or other defect. Each outside shipping container must be plainly marked "INSIDE CONTAINERS COMPLY WITH PRESCRIBED SPECIFICATIONS."

(d) *Poisonous mixtures.* A mixture containing any poisonous material, Class A, or irritating material in such proportions that the mixture would be classed as poisonous under § 173.326(a) or § 173.381(a) must be shipped in packagings as authorized for these poisonous materials.

[29 FR 18743, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-70, 38 FR 5309, Feb. 27, 1973, Amdt. 173-94, 41 FR 16079, Apr. 15, 1976; 45 FR 32697, May 19, 1980]

§ 173.306 Limited quantities of compressed gases.

(a) Limited quantities of compressed gases for which exceptions are permitted as noted by reference to this section in § 172.101 of this subchapter are excepted from labeling (except when offered for transportation by air) and, unless required as a condition of the exception, specification packaging requirements of this subchapter when packed in accordance with the following paragraphs. In addition, shipments are not subject to Subpart F of Part 172 of this subchapter, to Part 174 of this subchapter except § 174.24 and to Part 177 of this subchapter except § 177.817.

(1) When in containers of not more than 4 fluid ounces capacity (7.22 cubic inches or less) except cigarette lighters. Special exceptions for shipment of certain compressed gases in the ORM-D class are provided in Subpart N of this part.

(2) When in metal containers filled with a material that is not classed as a hazardous material to not more than 90 percent of capacity at 70° F. then charged with nonflammable, nonliquefied gas. Each container must be tested to three times the pressure at 70° F. and, when refilled, be retested to three times the pressure of the gas at 70° F. Also, one of the following conditions must be met:

(i) Container is not over 1 quart capacity and charged to not more than 170 psig at 70° F. and must be packed in a strong outside packaging, or

(ii) Container is not over 30 gallons capacity and charged to not more than 75 psig at 70° F.

(3) When in a metal container charged with a solution of materials and compressed gas or gases which is nonpoisonous, provided all of the following conditions are met. Special exceptions for shipment of aerosols in the ORM-D class are provided in Subpart N of this part.

(i) Capacity must not exceed 50 cubic inches (27.7 fluid ounces).

(ii) Pressure in the container must not exceed 180 psig at 130° F. If the pressure exceeds 140 psig at 130° F., but does not exceed 160 psig at 130° F., a specification DOT 2P (§ 178.33 of this subchapter) inside metal container must be used; if the pressure exceeds 160 psig at 130° F., a specification DOT 2Q (§ 178.33a of this subchapter) inside metal container must be used. In any event, the metal container must be capable of withstanding without bursting a pressure of one and one-half times the equilibrium pressure of the content at 130° F.

(iii) Liquid content of the material and gas must not completely fill the container at 130° F.

(iv) The container must be packed in strong outside packagings.

(v) Each completed container filled for shipment must have been heated until the pressure in the container is equivalent to the equilibrium pressure of the content at 130° F. (55° C.) without evidence of leakage, distortion, or other defect.

(vi) Each outside packaging must be marked "INSIDE CONTAINERS COMPLY WITH PRESCRIBED REGULATIONS."

(b) *Exemptions for foodstuffs, soap, biologicals, electronic tubes, and audible fire alarm systems.* Limited quantities of compressed gases, (except poisonous gases as defined by § 173.326) for which exceptions are provided as indicated by reference to this section in § 172.101 of this subchapter, when in accordance with one of the following paragraphs are excepted from labeling (except when offered for transportation by air) and the specification packaging requirements of this subchapter. In addition, shipments are not subject to Subpart F of Part 172 of this subchapter, to Part 174 of this subchapter except § 174.24 and to Part 177 of this subchapter, except § 177.817. Special exceptions for shipment of certain compressed gases in the ORM-D class are provided in Subpart N of this part.

(1) Foodstuffs or soaps in a nonrefillable metal container not exceeding 50 cubic inches capacity (27.7 fluid ounces), with soluble or emulsified compressed gas, provided the pressure in the container does not exceed 140 p.s.i.g. at 130° F. The metal container must be capable of withstanding without bursting a pressure of one and one-half times the equilibrium pressure of the content at 130° F.

(i) Containers must be packed in strong outside packagings.

(ii) Liquid content of the material and the gas must not completely fill the container at 130° F.

(iii) Each outside packaging must be marked "INSIDE CONTAINERS COMPLY WITH PRESCRIBED REGULATIONS."

(2) Cream in refillable metal receptacles with soluble or emulsified compressed gas. Containers must be of such design that they will hold pressure without permanent deformation up to 375 psig and must be equipped with a device designed so as to release pressure without bursting of the container or dangerous projection of its parts at higher pressures. This exception applies to shipments offered for transportation by refrigerated motor vehicles only.

(3) Nonrefillable metal containers charged with a solution containing biological products or a medical preparation which could be deteriorated by heat, and compressed gas or gases, which is nonpoisonous and nonflammable. The capacity of each container may not exceed 35 cubic inches (19.3 fluid ounces). The pressure in the container may not exceed 140 psig at 130° F., and the liquid content of the product and gas must not completely fill the containers at 130° F. One completed container out of each lot of 500 or less, filled for shipment, must be heated, until the pressure in the container is equivalent to equilibrium pressure of the content at 130° F. There must be no evidence of leakage, distortion, or other defect. Container must be packed in strong outside packagings.

(4) Electronic tubes, each having a volume of not more than 30 cubic inches and charged with gas to a pressure of not more than 35 psig and packed in strong outside packagings.

(5) Audible fire alarm systems powered by a compressed gas contained in an inside metal container when shipped under the following conditions:

(i) Each inside container must have contents which are not flammable, poisonous, or corrosive as defined under this part,

(ii) Each inside container may not have a capacity exceeding 35 cubic inches (19.3 fluid ounces),

(iii) Each inside container may not have a pressure exceeding 70 psig at 70° F. and the liquid portion of the gas may not completely fill the inside container at 130° F., and

(iv) Each nonrefillable inside container must be designed and fabricated with a burst pressure of not less than four times its charged pressure at 130° F. Each refillable inside container must be designed and fabricated with a burst pressure of not less than five times its charged pressure at 130° F.

(c) *Fire extinguishers.* Fire extinguishers charged with limited quantities of a compressed gas to not more than 240 psig at 70° F. are excepted from labeling (except when offered for transportation by air) and the specification packaging requirements of this subchapter when shipped under the following conditions. In addition, shipments are not subject to Subpart F of Part 172 of this subchapter, to Part 174 of this subchapter except § 174.24 and to Part 177 of this subchapter except § 177.817.

(1) Each fire extinguisher must be shipped as an inside packaging;

(2) Each fire extinguisher must have contents which are not flammable, poisonous, or corrosive as defined under this part;

(3) Each fire extinguisher under stored pressure may not have an internal volume exceeding 1,100 cubic inches. For fire extinguishers not exceeding 35 cubic inches capacity, the liquid portion of the gas plus any additional liquid or solid must not completely fill the container at 130° F. Fire extinguishers exceeding 35 cubic inches capacity may not contain any liquefied compressed gas;

(4) Each fire extinguisher manufactured on and after January 1, 1976, must be designed and fabricated with a burst pressure of not less than six times its charged pressure at 70° F. when shipped.

(5) Each fire extinguisher must be tested, without evidence of failure or damage, to at least three times its charged pressure at 70° F. but not less than 120 psig before initial shipment. For any subsequent shipment, each fire extinguisher must be in compliance with the retest requirements of the Occupational Safety and Health Administration Regulations of the Department of Labor, 29 CFR 1910.157(e), and;

(6) Each fire extinguisher must be marked to indicate the year of the test (within 90 days of the actual date of the original test) and "MEETS DOT REQUIREMENTS." This marking will be considered a certification that the fire extinguisher was manufactured in accordance with the requirements of this section.

NOTE: The words "This extinguisher meets all requirements of 49 CFR 173.306" may be displayed in place of "MEETS DOT REQUIREMENTS" on extinguishers manufactured prior to January 1, 1976.

(7) When Specification 2P or 2Q (§§ 178.33, 178.33a of this subchapter) packagings are used, paragraphs (c)(4)-(6) of this section are not applicable provided each packaging meets the requirements of paragraph (a) of this section.

(d) *Truck bodies or trailers on flat cars; automobiles, motorcycles, tractors, or other self-propelled vehicles.* (1) Truck bodies or trailers with automatic heating or refrigerating equipment of the gas burning type may be shipped with fuel tanks filled and equipment operating or inoperative, when used for the transportation of other freight and loaded on flat cars as part of a joint rail-highway movement, provided the equipment and fuel supply are of a type examined by the Bureau of Explosives and approved by the Director, OHMT. The heating or refrigerating equipment is considered as carriers' equipment and is not subject to any other requirements of this subchapter.

(2) Automobiles, motorcycles, tractors, or other self-propelled vehicles equipped with liquefied petroleum gas or other compressed gas fuel tanks, provided such tanks are securely closed, are not subject to any other requirements for transportation by rail or highway. For transportation by water, see §§ 176.905 and 176.78(k) of this subchapter. For transportation by air, the fuel tank must be removed or emptied and securely closed.

(3) A cylinder which is a component part of a passenger restraint system and is installed in a motor vehicle, charged with nonliquefied, nonflammable compressed gas and having no more than two actuating cartridges per valve, is excepted from the requirements of Parts 170-189 of this subchapter except:

(i) Unless otherwise authorized by the Department, each cylinder must be in compliance with one of the cylinder specifications in Part 178 of this subchapter and authorized for use in § 173.302 for the gas it contains;

(ii) Each cylinder must be in compliance with the filling requirements of § 173.301; and

(iii) Each actuating cartridge must be approved in accordance with § 173.86 and meet the definition set forth in § 173.100(w).

(4) A cylinder which is part of a tire inflator system in a motor vehicle, charged with a nonliquefied, nonflammable compressed gas is excepted from the requirements of Parts 170-189 of this subchapter except:

(i) Unless otherwise authorized by the Department, each cylinder must be in compliance with one of the cylinder specifications in Part 178 and authorized for use in § 173.302 for the gas it contains;

(ii) Each cylinder must be in compliance with the filling requirements of § 173.301.

(iii) Each cylinder must be securely installed in the trunk of the motor vehicle and the valve must be protected against accidental discharge.

NOTE: A cylinder containing a gas generator may be included within the provisions of this exception if the requirements of § 173.34(d) are satisfied.

(e) *Refrigerating machines.* (1) New (unused) refrigerating machines or components thereof are excepted from the specification packaging requirements of this part if they meet the following conditions. In addition, shipments are not subject to Subpart F of Part 172 of this subchapter, to Part 174 of this subchapter except § 174.24 and to Part 177 of this subchapter except § 177.817.

(i) Each pressure vessel may not contain more than 5,000 pounds of Group I refrigerant as classified in American National Standard B9.1 or not more than 50 pounds of refrigerant other than Group I.

(ii) Machines or components having two or more charged vessels may not contain an aggregate of more than 2,000 pounds of Group I refrigerant or more than 100 pounds of refrigerant other than Group I.

(iii) Each pressure vessel must be equipped with a safety device meeting the requirements of American National Standard B9.1.

(iv) Each pressure vessel must be equipped with a shut-off valve at each opening except openings used for safety devices and with no other connection. These valves must be closed prior to and during transportation.

(v) Pressure vessels must be manufactured, inspected and tested in accordance with American National Standard B9.1, or when over 6 inches internal diameter, in accordance with the ASME Code.

(vi) All parts subject to refrigerant pressure during shipment must be tested in accordance with American National Standard B9.1.

(vii) The liquid portion of the refrigerant, if any, may not completely fill any pressure vessel at 130° F.

(viii) The amount of refrigerant, if liquefied, may not exceed the filling density prescribed in § 173.304.

(f) *Accumulators.* The following applies to accumulators, which are hydraulic accumulators containing nonliquefied, nonflammable gas, and nonflammable liquids or pneumatic accumulators containing nonliquefied, nonflammable gas, fabricated from materials which will not fragment upon rupture.

(1) Accumulators installed in motor vehicles, construction equipment, and assembled machinery and designed and fabricated with a burst pressure of not less than five times their charged pressure at 70° F., when shipped, are not subject to the requirements of this subchapter.

(2) Accumulators charged with limited quantities of compressed gas to not more than 200 p.s.i.g. at 70° F. are excepted from labeling (except when offered for transportation by air) and the specification packaging requirements of this subchapter when shipped under the following conditions. In addition, shipments are not subject to Subpart F of Part 172 of this subchapter, to Part 174 of this subchapter except § 174.24 and to Part 177 of this subchapter except § 177.817.

(i) Each accumulator must be shipped as an inside packaging.

(ii) Each accumulator may not have a gas space exceeding 2,500 cubic inches under stored pressure, and

(iii) Each accumulator must be tested, without evidence of failure or damage, to at least three times its charged pressure of 70° F., but not less than 120 p.s.i. before initial shipment and before each refilling and reshipment.

(3) Accumulators with a charging pressure exceeding 200 p.s.i.g. at 70° F. are excepted from labeling (except when offered for transportation by air) and the specification packaging requirements of this subchapter when shipped under the following conditions:

(i) Each accumulator must be in compliance with the requirements stated in paragraph (f)(2), (i), (ii), and (iii) of this section, and

(ii) Each accumulator must be designed and fabricated with a burst pressure of not less than five times its charged pressure at 70° F. when shipped.

(g) *Water pump system tank.* Water pump system tanks charged with compressed air or limited quantities of nitrogen to not over 40 psig for single-trip shipment to installation sites are excepted from labeling (transportation by air not authorized) and the specification packaging requirements of this subchapter when shipped under the following conditions. In addition, shipments are not subject to Subpart F of this subchapter, to Part 174 of this subchapter except § 174.24 and Part 177 except § 177.817.

(1) The tank must be of steel, welded with heads concave to pressure, having a rated water capacity not exceeding 120 gallons and with outside diameter not exceeding 24 inches. Safety relief devices not required.

(2) The tank must be pneumatically tested to 100 psig. Test pressure must be permanently marked on the tank.

(3) The stress at prescribed pressure must not exceed 20,000 psi using formula:

$S = Pd/2t$

where:

S = wall stress in pounds per square inch:
P = prescribed pressure for the tank of at least 3 times charged pressure at 70° F or 100 psig, whichever is greater;
d = inside diameter in inches;
t = minimum wall thickness, in inches.

(4) The burst pressure must be at least 6 times the charge pressure at 70° F.

(5) Each tank must be overpacked in a strong outside container in accordance with § 173.301(k).

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 173-94, 41 FR 16079, Apr. 15, 1976]

EDITORIAL NOTE: For Federal Register citations affecting § 173.306 see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.307 Exceptions for compressed gases.

(a) The following materials are not subject to the requirements of this subchapter:

(1) Carbonated beverages.

(2) Except as provided in § 175.10(a)(2) of this subchapter, tires when inflated to pressures not greater than their rated inflation pressures.

(3) Balls used for sports.

(4) Refrigerating machines including dehumidifiers and air conditioners, and components thereof such as precharged tubing containing 25 pounds or less of nonflammable liquefied gas.

[Amdt. 173-94, 41 FR 16081, Apr. 15, 1976, as amended by Amdt. 173-135, 45 FR 13090, Feb. 28, 1980]

§ 173.308 Cigarette lighter or other similar device charged with fuel.

(a) In addition to the requirements of § 173.21(e), a cigarette lighter or other similar device charged with a flammable gas must be shipped as follows:

(1) No more than 2.3 fluid ounces of liquefied gas may be loaded into each device;

(2) The liquid portion of the gas may not exceed 85 percent of the volumetric capacity of each fluid chamber at 60° F;

(3) Each device, including closures, must be capable of withstanding without leakage or rupture an internal pressure of at least two times the vapor pressure of the fuel at 130° F; and

(4) Devices must be overpacked in packaging that is designed or arranged to prevent movement of the device itself.

(b) When no more than 1,500 devices covered by this section are transported in one motor vehicle by highway, the requirements of Parts 172 and 177 of this subchapter do not apply.

(c) For transportation by water in a closed transport vehicle or a closed freight container, the following warning must be affixed to the access doors: "WARNING—MAY CONTAIN EXPLOSIVE MIXTURES WITH AIR—KEEP IGNITION SOURCES AWAY WHEN OPENING." The warning must be on a contrasting background and must be readily legible from a distance of 25 feet.

[Amdt. 173-94, 41 FR 16081, Apr. 15, 1976, as amended by Amdt. 173-94A, 41 FR 40683, Sept. 20, 1976; Amdt. 173-120, 43 FR 39792, Sept. 7, 1978; Amdt. 173-165, 48 FR 28101, June 20, 1983]

§ 173.314 Requirements for compressed gases in tank cars.

(a) *Definitions.* For definitions of compressed gases, see § 173.300.

(b) *General requirements.* (1) Tank cars containing compressed gases must not be shipped unless they were loaded by or with the consent of the owner thereof.

(2) Tank cars must not contain gases capable of combining chemically and must not be loaded with any gas which combines chemically with the gas previously loaded therein, until all residue has been removed and interior of tank thoroughly cleaned.

(3) For cars of the DOT-106A and 110A class, the tanks must be placed in position and attached to car structure by the shipper.

(4) Wherever the word "approved" is used in this part of the regulations, it means approval by the Association of American Railroads Committee on Tank Cars as prescribed in § 179.3 of this subchapter.

(5) Each tank car, except series 106A*** or 110A***, containing a flammable compressed gas or flammable compressed gas mixture must be marked with the name of contents (§ 172.101 of this subchapter) in accordance with the requirements of § 172.330 of this subchapter or as otherwise approved by the Department.

(6) Each tank car containing anhydrous ammonia; hydrogen chloride, refrigerated liquid; or chlorine must be marked "Anhydrous Ammonia," "Hydrogen Chloride," or "Chlorine," as appropriate, in accordance with the requirements of § 172.330 of this subchapter.

(c) *Authorized gases, filling densities, tank cars.* A compressed gas offered for transportation in a tank car must be prepared in accordance with paragraphs (b) through (h) of this section, § 173.10, and the following table (for cryogenic liquids, see § 173.319):

Kind of gas	Maximum permitted filling density, Note 1	Required tank car, see § 173.31(a) (2) and (3)
Ammonia solution	Note 21	DOT-105A100-W, 105A100AL-W, 109A100AL-W, 109A300-W, 111A100-W-4, Note 20.
Anhydrous ammonia	50	DOT-106A500-X, Note 25.
	57	DOT-105A300W, Note 24.
	57	DOT-112S400F, 112S340-W, 114S340-W Note 15.
	58.8	DOT-112S400F, 112S340W, 114S340-W, Note 15.
Argon	Note 20	DOT-107A.
Bromotrifluoromethane (R-13B1 or H-1301)	124	DOT-110A800W, Notes 13 and 25.
Butadiene (pressure not exceeding 75 pounds per square inch at 105°F.) inhibited.	Notes 18 and 21	ICC-105A100[1], 105A100-W, 111A100-W-4, Notes 4 and 23.
Butadiene (pressure not exceeding 255 pounds per square inch at 115°F.), inhibited.	Notes 18 and 21	DOT-112T340W, 112J340W, 114T340W, 114J340W, Notes 4 and 20.
Butadiene (pressure not exceeding 300 pounds per square inch at 115°F.), inhibited.	Notes 18 and 21	DOT-112T400W, 112J400W, 114T400W, 114J400W, Notes 4 and 20.
Carbon dioxide, refrigerated liquid	Note 5	DOT-105A500W, Note 6.
Chlorine	125	DOT-106A500X, Note 25.
	125	DOT-105A500W, Note 12.
Chlorodifluoroethane (R-142b) (l-Chloro-l,l-difluoroethane); Notes 4, Note 13.	100	DOT-106A500X, 110A500W, Note 25.
		DOT-105A100W, Note 23.
		DOT-114T340W, 114J340W, Notes 28 and 29.
Chlorodifluoromethane (R-22); Note 13	105	DOT-106A500X, 110A500W, Note 25.
	110	DOT-105A300W.
	108	DOT-112A400W.
	Note 21	DOT-114A340W, Note 29.
Chloropentafluoroethane (R-115); Note 13.	Note 21	DOT-106A500X, 110A500W, Note 25.
		DOT-105A300W
		DOT-114A340W, Note 29.
Chlorotetrafluoroethane (R-124); Note 13.	125	DOT-106A500X, 110A500W, Note 25.
	126	DOT-112A400W
Chlorotrifluoromethane (R-13); Note 13	Note 21	DOT-105A300W, DOT-114A340W, Note 29.
Crude nitrogen fertilizer solution	Note 21	DOT-106A500X
		DOT-105A300-W, 109A300-W, Note 20.
Crude nitrogen fertilizer solution (pressure not exceeding 75 pounds per square inch at 105° F.).	Note 21	DOT-106A500X.
		DOT-105A100-AL-W, 109A100-AL-W, Note 20.
Dichlorodifluoromethane (R-12), Note 13	119	DOT-106A500X, 110A500W, Note 25.
	123	DOT-112A340W, 114A340W, Note 29.
	125	DOT-105A300W.
Difluoroethane (R-152a), Note 4, Note 13	79	DOT-106A500X, 110A500W, Note 25.
	79	DOT-112T400W, 112J400W, 114T340W, 114J340W, Notes 28 and 29.

Kind of gas	Maximum permitted filling density, Note 1	Required tank car, see § 173.31(a) (2) and (3)
Dimethylamine, anhydrous	84	DOT-105A300W, Note 23.
	59	DOT-106A500X.
	62	DOT-105A300W, Notes 4, 23 and 26.
Dimethyl ether	61	DOT-112T340W, 112J340W, Note 26.
	59	DOT-106A500X, 110A500-W.
	62	DOT-105A300W, Notes 4 and 23.
Fertilizer ammoniating solution containing free ammonia.	Note 21	DOT-106A500X. DOT-105A300-W, 109A300-W, Note 20.
Fertilizer ammoniating solution containing free ammonia (pressure not exceeding 75 pounds per square inch at 105° F.).	Note 21	DOT-106A500X. DOT-105A100-AL-W, 109A100-AL-W, Note 20.
Fertilizer ammoniating solution containing free ammonia (pressure not exceeding 150 pounds per square inch at 105° F.).	Note 21	DOT-106A500X. DOT-105A200-AL-W, Note 20.
Helium	Note 20	DOT-107A.
Hexafluoropropylene	110	DOT-106A500-X, 110A500-W, Note 25.
Hexafluoropropylene oxide	110	DOT-110A500w, Note 7.
Hydrogen	Note 20	DOT-107A, Note 2.
Hydrogen chloride, refrigerated liquid	89.0 maximum to 80.1 minimum at maximum 90 psig, when offered for transportation.	DOT-105A600W, Note 17.
Hydrogen sulfide	68	DOT-106A800X, Notes 7 and 8.
Liquid hydrocarbon gas (pressure not exceeding 75 pounds per square inch at 105°F).	Note 21	ICC-105A100[1], 105A100-W, 111A100-W-4, Notes 4 and 23.
Liquid hydrocarbon gas (pressure not exceeding 225 pounds per square inch at 105°F).	Note 21	DOT-105A300-W, Notes 4 and 23.
Liquid hydrocarbon gas (pressure not exceeding 300 pounds per square inch at 105°F).	Note 21	DOT-105A400-W, Notes 4 and 23.
Liquid hydrocarbon gas (pressure not exceeding 375 pounds per square inch at 105°F).	Note 21	DOT-105A500-W, Notes 4 and 23.
Liquid hydrocarbdon gas (pressure not exceeding 375 pounds per square inch at 130°F).	Note 21	DOT-106A500X.
Liquid hydrocarbon gas (pressure not exceeding 450 pounds per square inch at 105°F).	Note 21	DOT-105A600-W, Notes 4 and 23.
Liquefied petroleum gas (pressures not exceeding 75 pounds per square inch at 105°F).	Note 18	ICC-105A100[1], 105A100-W, 111A100-W-4, Notes 4 and 23.
Liquefied petroleum gas (pressure not exceeding 150 pounds per square inch,at 105°F).	Note 18	DOT-105A200-W, 105A200AL-W, Notes 4 and 23.
Liquefied petroleum gas (pressure not exceeding 225 pounds per square inch at 105°F).	Note 18	DOT-105A300-W, Notes 4, 20 and 23.
Liquefied petroleum gas (pressure not exceeding 255 pounds per square inch at 115°F).	Note 18	DOT-112T340-W, 112J340-W, 114T340W, 114J340-W, Notes 4 and 20.
Liquefied petroleum gas (pressure not exceeding 300 pounds per square inch at 105°F).	Note 18	DOT-105A400-W, Notes 4, 20, and 23.
Liquefied petroleum gas (pressure not exceeding 300 pounds per square inch at 115°F).	Note 18	DOT-112T400-F, 112J400-F, 112T400-W, 112J400-W, 114T400-W, 114J400-W, Notes 4 and 20.
Liquefied petroleum gas (pressure not exceeding 375 pounds per square inch at 105°F).	Note 18	DOT-105A500-W, Notes 4, 20 and 23.
Liquefield petroleum gas (pressure not exceeding 375 pounds per square inch at 130°F).	Note 18	DOT-106A500X.
Liquefied petroleum gas (pressure not exceeding 450 pounds per square inch at 105°F).	Note 18	DOT-105A600-W, Notes 4, 20 and 23.
Methylacetylene-propadiene, stabilized	Note 22	DOT-105A300W, 112T340W, 112J340W, 114T340W, 114J340W, 106A500X, Notes 4, 9 and 23.
Methyl chloride	84	DOT-106A500X, Note 25.
	85	DOT-112T340W, 112J340W, Note 4.
	86	DOT-105A300W, Notes 4 and 23.
Methyl chloride-methylene chloride mixture	Note 22	DOT-106A500X, Notes 7 and 14. DOT-105A300-W, Notes 4 and 23.
Methyl mercaptan	80	DOT-106A500X, Notes 7 and 14.
	82	DOT-105A300-W, Notes 4 and 23.
Methylamine, anhydrous	60	DOT-106A500X.
	62	DOT-105A300W, Notes 4, 23 and 26.
	61	DOT-112T340W, 112J340W, Notes 4 and 26.
Nitrogen	Note 20	DOT-107A.
Nitrogen fertilizer solution	Note 21	DOT-106A500X. DOT-105A300-W, 109A300-W, 109A300AL-W, Note 20.

Kind of gas	Maximum permitted filling density, Note 1	Required tank car, see § 173.31(a) (2) and (3)
Nitrogen fertilizer solution (pressure not exceeding 75 pounds per square inch at 105° F.).	Note 21	DOT-106A500X.
		DOT-105A100-AL-W, 109A100-AL-W, Note 20.
Nitrosyl chloride	110	DOT-106A800-X, Notes 7 and 11.
	124	DOT-105A300-W, Note 10.
Nitrous oxide	Note 5	DOT-105A500W, 105A600W, Note 6.
Oxygen	Note 20	DOT-107A.
Refrigerant gas, n.o.s. *or* Dispersant gas, n.o.s. (classed as a flammable gas) Note 13.	Note 21	DOT-106A500X, 110A500W, Note 25. DOT-105A300W, Note 23. DOT-112T340W, 112J340W, 114T340W, 114J340W, Notes 28 and 29.
Refrigerant gas, n.o.s. *or* Dispersant gas, n.o.s. (classed as a nonflammable gas) Note 13.	Note 21	DOT-106A500X, 110A500W, Note 25. DOT-105A300W, DOT-112A340W, 114A340W, Note 29.
Sulfur dioxide	125	DOT-106A500X, 110A500W, Note 25.
		DOT-105A200-W.
Sulfuryl fluoride	120	DOT-106A500-W.
Trifluorochloroethylene	115	DOT-106A500X, 110A500W, Note 25
	120	DOT-105A300-W, Notes 4 and 23.
Trimethylamine, anhydrous	57	DOT-106A500X.
	59	DOT-105A300W, Notes 4, 23 and 26.
	58	DOT-112T340W, 112J340W, Note 26.
Vinyl chloride, Note 9	84	DOT-106A500X, Note 7.
	87	DOT-105A200W, Notes 4, 16 and 23.
	86	DOT-112T340W, 112J340W, 114T340W, 114J340W, Note 4.
Vinyl fluoride, inhibited	59.6 maximum to 53.6 minimum at maximum 105 psig, when offered for transportation.	DOT-105A600W, Notes 17 and 23.
Vinyl methyl ether, Note 9	68	ICC-105A100 [1], 105A100W, Notes 4 and 23.
	68	DOT-106A500X, Note 7.

[1] Use of existing tank cars authorized, but new construction not authorized.

NOTE 1: The filling density for liquefied gases is hereby defined as the percent ratio of the weight of gas in the tank to the weight of water that the tank will hold. For determining the water capacity of the tank in pounds, the weight of a gallon (231 cubic inches) of water at 60° F. in air shall be 8.32828 pounds.

NOTE 2: Each tank must be equipped with one or more safety relief devices of approved type and discharge area; the discharge outlet of each safety relief device must be connected to a manifold having an unobstructed discharge area of at least 1½ times the total discharge area of the safety relief devices connected to the manifold; all manifolds must be connected to a single common header having an unobstructed discharge outlet pointing upward and extending above top of the car; the header and the header outlet must each have an unobstructed discharge area at least equal to the total discharge area of the manifolds connected to the header; the header outlet must be equipped with an approved ignition device which will instantly ignite any hydrogen discharged through the safety relief device.

NOTE 3: [Reserved]

NOTE 4: For tank cars other than DOT-106A and DOT-110A used for the transportation of liquefied flammable gases, interior pipes of loading and unloading valves must be equipped with excess-flow valves of approved design.

NOTE 5: The liquid portion of the gas at 0° F. must not completely fill the tank.

NOTE 6: Tank must be insulated with an approved material of a thickness so that the thermal conductance is not more than 0.03 B.t.u. per square foot, per degree F. differential in temperature per hour; except that the insulation thickness directly over the center sills may be reduced to give thermal conductance not exceeding 0.04 B.t.u. per square foot, per degree F. differential in temperature per hour; this reduction is to permit an anchorage which must not exceed 7 inches from top of center sills to bottom of tank. Tank must be equipped with one safety relief valve of approved design set to open at a pressure not exceeding ¾ of the test pressure of the tank and one frangible disc of approved design set to function at a pressure less than the test pressure of the tank. The discharge capacity of each of these safety relief devices must be sufficient to prevent building up of pressure in tank in excess of ¾ of the test pressure of the tank. Tanks must be equipped with two pressure-regulating valves of approved design set to open at a pressure not to exceed 350 psi on 105A500-W tanks and at a pressure not to exceed 400 psi on 105A600-W tanks. Each regulating valve and safety relief device must have its final discharge piped to the outside of the protective housing.

NOTE 7: Specification 106A or 110A tanks authorized only for transportation by rail freight and by highway. (See §§ 174.204 and 177.834(m) of this subchapter for special requirements.)

NOTE 8: Each tank must be equipped with adequate safety relief devices of the fusible plug type having a yield temperature not over 170° F., nor less than 157° F. Each device must be resistant to extrusion of the fusible alloy and leak tight at 130° F. Each valve outlet must be sealed by a threaded cap or a threaded solid plug. In addition, all valves must be protected by a metal cover.

NOTE 9: All parts of valves and safety relief devices in contact with content of tank must be of a metal or other material suitably treated if necessary which will not cause formation of any acetylides.

NOTE 10: Tanks must be made of or clad with a metal not subject to rapid deterioration by the lading; all appurtenances such as manhole covers, venting, loading and discharge valves, safety relief valves, check valves, and eduction pipes, must be made of metal not subject to rapid deterioration by the lading; cork must be used as an insulating material.

NOTE 11: Tanks for nitrosyl chloride shall be nickel-clad and safety relief devices shall be of the fusible plug type and shall function at a temperature of not exceeding 175° F. and be vapor tight at 130° F.

NOTE 12: For special tank requirements applying to chlorine, see § 179.102-2 of this subchapter. The quantity of chlorine loaded into a single-unit tank car must not exceed 90 tons. Nominal 16- , 30- , 55- , 85- or 90-ton tank car tanks must not be loaded in excess of the normal lading weights. Tank cars built to ICC-105A500 may be stenciled either ICC-105A300 or ICC-105A500; tank cars built to ICC or DOT 105A500W may be stenciled either 105A300W or 105A500W; each tank must be equipped with safety relief valve required by the stenciled specification. Cars not larger than 55-ton chlorine capacity built to

ICC-105A300, or ICC-105A300W may be continued in service if equipped with excess flow valves in accordance with § 179.102-2. DOT-105A cars having forge welded anchors must not be used for transportation of chlorine.

NOTE 13: This gas may be transported in authorized tank car tanks stenciled "DISPERSANT GAS" or "REFRIGERANT GAS."

NOTE 14: Container shall not be equipped with safety relief devices of any description.

NOTE 15: A filling density of 58.8 percent may be used during the months of November through March, inclusive. When this filling density is used, tank cars must be loaded and shipped directly to consumers for unloading. Storage in transit is not permitted.

NOTE 16: Openings in tank heads to facilitate application of nickel lining are authorized on tank cars constructed before January 1, 1975. These openings must be closed in an approved (§ 179.3 of this subchapter) manner.

NOTE 17: See paragraph (g) of this section.

NOTE 18: See paragraph (f) of this section.

NOTE 19: See paragraph (f)(2) of this section.

NOTE 20: See paragraph (d)(1) of this section.

NOTE 21: See paragraph (d)(2) of this section.

NOTE 22: See paragraph (d) of this section.

NOTE 23: Each Specification 105 tank car built after August 31, 1981, shall conform to class DOT-105J. After December 31, 1986, each Specification 105 tank car built before September 1, 1981, and with a water capacity (shell full volume, including manways) exceeding 18,500 U.S. gallons shall conform to class DOT-105J. After December 31, 1986, each Specification 111 tank car with a water capacity (shell full volume, including manways) exceeding 18,500 U.S. gallons shall conform to class DOT-111J. Specification 111 tank cars built after March 1, 1984 are not authorized for the transportation of flammable gases.

NOTE 24: Each Specification 105 tank car built after August 31, 1981, shall conform to class DOT-105S. After December 31, 1986, each Specification 105 tank car built before September 1, 1981, and with a water capacity (shell full volume including manways) exceeding 18,500 U.S. gallons, shall conform to class DOT-105S.

NOTE 25: Specification 106 and 110A tanks for these commodities are authorized for transportation by rail freight, highway, and cargo vessel. (See §§ 174.204, 176.200, 176.230, and 177.834(m) of this subchapter for additional requirements.)

NOTE 26: For these materials only, Specifications 105A300W, and 112T340W or 112J340W tank cars may be equipped with safety relief devices with a start-to-discharge pressure setting of 247.5 psi and 280.5 psi respectively.

NOTE 27: [Reserved]

NOTE 28: DOT-114T340W and 114J340W tank cars may be equipped with bottom outlets, except that the bottom outlets must be rendered inoperative and effectively sealed to preclude bottom unloading when transporting flammable gases.

NOTE 29: A maximum safety relief valve setting of 280.5 psig is authorized on DOT Specification 114A340W, 114T340W, and 114J340W tank car tanks.

(d) *Filling limits*—(1) *Non-liquefied and liquefied gas.* The gas pressure at 105° F. in any insulated tank car tank of the DOT-105A and 109A-W class or Spec. DOT-111A100-W-4; at 115° F. in any uninsulated tank car tank of the DOT-112A-W and 114A-W class; or at 130° F. in any uninsulated tank car tank of the DOT-106A and 110A-W class must not exceed three-fourths times the prescribed retest pressure of the tank. The gas pressure at 130° F. in any uninsulated tank car tank of the DOT-107A series must not exceed seven-tenths of the marked test pressure of the tank.

NOTE 1: DOT-107A tanks may be charged with helium to a pressure 10 percent in excess of the marked maximum gas pressure at 130° F. of each tank.

(2) *Liquefied gas.* In addition to the requirements of paragraph (d)(1) of this section, the liquid portion of the gas at 105° F. must not completely fill an insulated tank, nor at 130° F. must not completely fill an uninsulated tank with the exception that the liquid portion of the gas at 115° F. must not completely fill an uninsulated tank car tank of the DOT-112A-W and 114A-W classes.

(e) *Verification of content.* The amount of liquefied gas loaded into each tank may be determined either by measurement or calculation of the weight. If by measurement, the weight must be checked after disconnecting the loading line by the use of proper scales. If by calculation, the weight of liquefied petroleum gas, methylacetylene-propadiene, stabilized, dimethylamine, monomethylamine, or trimethylamine may be calculated using the outage tables supplied by the tank car owners and the specific gravities as determined at the plant, and this computation must be checked by determination of specific gravity of product after loading. Carriers may verify calculated weights by use of proper scales. The use of a fixed tube gauge device is authorized for determining the weight of methyl mercaptan in Specification 105A300W tanks instead of weighing.

(f) *Special requirements for liquefied petroleum gas and butadiene tank cars*—(1) *Single unit tank cars.* Maximum filling density in single unit tank cars shall be as shown in the following table:

MAXIMUM PERMITTED FILLING DENSITY

Specific gravity at 60° F.	Insulated cars		Uninsulated cars	
	April through October	November through March (see Note 1)	April through October	November through March (see Note 1)
0.500	45.500	47.40	44.88	46.88
0.501	45.600	47.51	45.00	47.00
0.502	45.700	47.62	45.13	47.10
0.503	45.800	47.73	45.25	47.20
0.504	45.900	47.84	45.38	47.30
0.505	46.000	47.95	45.50	47.40
0.506	46.125	48.06	45.60	47.50
0.507	46.250	48.17	45.70	47.63
0.508	46.375	48.28	45.80	47.75
0.509	46.500	48.39	45.90	47.88
0.510	46.750	48.51	46.00	48.00
0.511	47.000	48.61	46.13	48.10
0.512	47.125	48.72	46.25	48.20
0.513	47.250	48.83	46.38	48.30
0.514	47.375	48.94	46.50	48.40
0.515	47.500	49.05	46.63	48.50
0.516	47.625	49.16	46.75	48.63
0.517	47.750	49.27	46.88	48.75
0.518	47.875	49.38	47.00	48.88
0.519	48.000	49.49	47.13	49.00
0.520	48.125	49.60	47.25	49.10
0.521	48.250	49.70	47.38	49.20
0.522	48.375	49.81	47.50	49.30
0.523	48.500	49.92	47.63	49.40
0.524	48.600	50.03	47.75	49.50
0.525	48.700	50.14	47.88	49.63
0.526	48.800	50.25	48.00	49.75
0.527	48.900	50.36	48.13	49.88
0.528	49.000	50.47	48.25	50.00
0.529	49.125	50.58	48.38	50.10
0.530	49.250	50.69	48.50	50.20
0.531	49.375	50.79	48.63	50.30
0.532	49.500	50.90	48.75	50.40
0.533	49.625	51.01	48.88	50.50
0.534	49.750	51.12	49.00	50.63
0.535	49.875	51.23	49.13	50.75
0.536	50.000	51.34	49.25	50.88
0.537	50.100	51.45	49.38	51.00
0.538	50.200	51.56	49.50	51.10
0.539	50.300	51.67	49.60	51.20
0.540	50.400	51.78	49.70	51.30
0.541	50.500	51.88	49.80	51.40
0.542	50.625	51.99	49.90	51.50
0.543	50.750	52.09	50.00	51.63
0.544	50.875	52.20	50.13	51.75
0.545	51.000	52.31	50.25	51.88
0.546	51.100	52.41	50.38	52.00
0.547	51.200	52.52	50.50	52.10
0.548	51.300	52.62	50.63	52.20
0.549	51.400	52.73	50.75	52.30
0.550	51.500	52.84	50.88	52.40
0.551	51.625	52.94	51.00	52.50
0.552	51.750	53.05	51.13	52.63
0.553	51.875	53.16	51.25	52.75
0.554	52.000	53.26	51.38	52.88
0.555	52.125	53.37	51.50	53.00
0.556	52.250	53.48	51.60	53.10
0.557	52.375	53.58	51.70	53.20
0.558	52.500	53.69	51.80	53.30
0.559	52.625	53.80	51.90	53.40
0.560	52.750	53.91	52.00	53.50
0.561	52.875	54.01	52.13	53.63
0.562	53.000	54.12	52.25	53.75
0.563	53.100	54.22	52.38	53.88

MAXIMUM PERMITTED FILLING DENSITY—Continued

Specific gravity at 60° F.	Insulated cars		Uninsulated cars	
	April through October	November through March (see Note 1)	April through October	November through March (see Note 1)
0.564	53.200	54.33	52.50	54.00
0.565	53.300	54.43	52.63	54.10
0.566	53.400	54.54	52.75	54.20
0.567	53.500	54.64	52.88	54.30
0.568	53.600	54.75	53.00	54.40
0.569	53.700	54.85	53.10	54.50
0.570	53.800	54.96	53.20	54.60
0.571	53.900	55.06	53.30	54.70
0.572	54.000	55.17	53.40	54.80
0.573	54.125	55.27	53.50	54.90
0.574	54.250	55.38	53.63	55.00
0.575	54.375	55.48	53.75	55.13
0.576	54.500	55.59	53.88	55.25
0.577	54.600	55.69	54.00	55.38
0.578	54.700	55.80	54.10	55.50
0.579	54.800	55.90	54.20	55.60
0.580	54.900	56.01	54.30	55.70
0.581	55.000	56.11	54.40	55.80
0.582	55.100	56.22	54.50	55.90
0.583	55.200	56.32	54.63	56.00
0.584	55.300	56.43	54.75	56.13
0.585	55.400	56.53	54.88	56.25
0.586	55.500	56.64	55.00	56.38
0.587	55.625	56.74	55.13	56.50
0.588	55.750	56.85	55.25	56.60
0.589	55.875	56.95	55.38	56.70
0.590	56.000	57.06	55.50	56.80
0.591	56.090	57.15	55.60	56.90
0.592	56.180	57.25	55.70	57.00
0.593	56.270	57.34	55.80	57.10
0.594	56.360	57.44	55.90	57.20
0.595	56.450	57.53	56.00	57.30
0.596	56.540	57.63	56.13	57.40
0.597	56.630	57.72	56.25	57.50
0.598	56.720	57.82	56.38	57.60
0.599	56.810	57.91	56.50	57.70
0.600	56.900	58.01	56.62	57.80
0.601	56.990	58.10	56.73	57.90
0.602	57.080	58.20	56.84	58.00
0.603	57.170	58.29	56.95	58.13
0.604	57.260	58.39	57.07	58.25
0.605	57.330	58.49	57.18	58.38
0.606	57.440	58.58	57.30	58.50
0.607	57.530	58.68	57.41	58.63
0.608	57.620	58.77	57.52	58.75
0.609	57.710	58.87	57.64	58.88
0.610	57.800	58.97	57.76	59.00
0.611	57.890	59.06	57.87	59.10
0.612	57.980	59.16	57.98	59.20
0.613	58.070	59.26	58.09	59.30
0.614	58.160	59.35	58.21	59.40
0.615	58.250	59.45	58.32	59.50
0.616	58.340	59.55	58.43	59.63
0.617	58.430	59.64	58.55	59.75
0.618	58.520	59.74	58.66	59.88
0.619	58.610	59.84	58.77	59.97
0.620	58.700	59.94	58.89	60.07
0.621	58.790	60.03	59.00	60.18
0.622	58.880	60.13	59.12	60.28
0.623	58.970	60.23	59.23	60.38
0.624	59.060	60.32	59.34	60.49
0.625	59.150	60.42	59.46	60.59
0.626	59.240	60.52	59.57	60.70

MAXIMUM PERMITTED FILLING DENSITY—Continued

Specific gravity at 60° F	Insulated cars: April through October	Insulated cars: November through March (see Note 1)	Uninsulated cars: April through October	Uninsulated cars: November through March (see Note 1)
0.627	59.330	60.61	59.68	60.80
0.628	59.420	60.71	59.80	60.90
0.629	59.510	60.81	59.91	61.01
0.630	59.600	60.91	60.02	61.11
0.631	59.690	61.00	60.13	61.18
0.632	59.780	61.10	60.28	61.28
0.633	59.870	61.19	60.34	61.38
[illegible]	59.960	61.29	60.44	61.47
[illegible]	60.050	61.39	60.55	61.57

NOTE 1. When these filling densities are used, tank cars must be shipped directly to consumers for unloading. Storage in transit is not permitted.

(2) *DOT-106A class tank cars.* Maximum filling density in DOT-106A class tank cars shall be as shown in § 173.304(d)(1).

(g) *Special requirements for hydrogen chloride, refrigerated liquid, and vinyl fluoride, inhibited.* (1) The shipper shall notify the Bureau of Explosives whenever a car is not received by the consignee within 20 days from the date of shipment.

(2) A tank car containing hydrogen chloride, refrigerated liquid must have the auxiliary valve on the pressure relief device closed during transportation.

(h) *Foreign tank cars in domestic use.* Except as authorized by § 171.12a tank cars made in foreign countries, except Canada, must not be used in domestic traffic until they have been tested in this country and proper reports rendered as required by the specifications that apply.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[29 FR 18743, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations to § 173.314, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.315 Compressed gases in cargo tanks and portable tanks.

(a) A compressed gas offered for transportation in a cargo tank or a portable tank must be prepared in accordance with this section (for cryogenic liquids, see § 173.318) and may only be shipped in a tank as provided in §§ 173.32, 173.33 and this section, as follows:

(1) Compressed gases must not be shipped in cargo tanks or portable tank containers except as provided in this section and §§ 173.32 and 173.33, and in the following table (for marking requirements see §§ 172.326 and 172.328 of this subchapter):

Kind of gas	Maximum permitted filling density		Specification container required	
	Percent by weight (see Note 1)	Percent by volume (see par. (f) of this section)	Type (see Note 2)	Minimum design pressure (psig)
Anhydrous ammonia (see Notes 14 and 17 and paragraph (1) of this section)	56	82; see Note 5	DOT-51, MC-330, MC-331; see Notes 12 and 17	265; see Note 17
Anhydrous dimethylamine	59	See Note 7	DOT-51, MC-330, MC-331	150
Anhydrous monomethylamine	60	do	do	Do
Anhydrous trimethylamine	57	do	do	Do
Ammonia solution	See par. (c) of this section	do	MC-330, MC-331; see Note 12	100; see par. (c)(1) of this section
Bromotrifluoromethane (R-13B1 or H-1301). (See Note 9)	133	See Note 7	DOT-51, MC-330, MC-331	365
Butadiene, inhibited	See par. (b) of this section	See par. (b) of this section	DOT-51, MC-330, MC-331	100
Carbon dioxide, refrigerated liquid	See par. (c) of this section	95	do	200; see Note 3
Chlorine	125	See Note 7	MC-330, MC-331	225; see Notes 4 and 8
Chlorodifluoroethane (R-142b) (1-Chloro 1,1-difluoroethane). (See Note 9)	100	See Note 7	DOT-51, MC-330, MC-331	100

Kind of gas	Maximum permitted filling density		Specification container required	
	Percent by weight (see Note 1)	Percent by volume (see par. (f) of this section)	Type (see Note 2)	Minimum design pressure (psig)
Chlorodifluoromethane (R-22). (See Note 9)	105	See Note 7	DOT-51, MC-330, MC-331	250
Chloropentafluoroethane (R-115). (See Note 9)	See par. (c) of this section	See Note 7	DOT-51, MC-330, MC-331	See par. (c)(1) of this section
Chlorotrifluoromethane (R-13). (See Note 9)	See par. (c) of this section	See Note 7	DOT-51, MC-330, MC-331	See par. (c)(1) of this section
Dichlorodifluoromethane (R-12). (See Note 9)	119	See Note 7	DOT-51, MC-330, MC-331	150
Difluoroethane (R-152a). (See Note 9)	79	See Note 7	DOT-51, MC-330, MC-331	150
Dimethyl ether (see Note 16)	59	do	do	200
Ethane, refrigerated liquid		See par. (c) of this section	MC-331, MC-338	100, see Note 11
Ethane-propane mixture, refrigerated liquid		See par. (c) of this section	MC-331, MC-338	275, see Note 11
Hexafluoropropylene	110	See Note 7	DOT-51, MC-330, MC-331	250
Hydrogen chloride, refrigerated liquid	103.0 91.6 86.7	See Note 7 do do	MC-331, MC-338 do do	100, see Note 11 300, see Note 11 450, see Note 11
Liquefied petroleum gas (see Note 15)	See par. (b) of this section	See par. (b) of this section	DOT-51, MC-330, MC-331	See par. (c)(1) of this section
Methylacetylene-propadiene, stabilized (see Note 13)	53	90	DOT 51, MC 330, MC 331	200
Methyl chloride	84	88.5	do	150
Methyl chloride (optional portable tank 2,000 pounds water capacity, fusible plug)	do	See Note 6	DOT-51	225
Methyl mercaptan	80	90	DOT-51, MC-330, MC-331	100
Nitrous oxide, refrigerated liquid	See par. (c) of this section	95	do	200, See Note 3
Refrigerant gas, n.o.s. or Dispersant gas, n.o.s. (See Note 9)	See par. (c) of this section	See Note 7	DOT-51, MC-330, MC-331	See par. (c)(1) of this section
Sulfur dioxide (tanks not over 1,200 gallons water capacity)	125	87.5	do	150, see Note 4
Sulfur dioxide (tanks over 1,200 gallons water capacity)	do	do	do	125, see Note 4
Sulfur dioxide (optional portable tank 1,000-2,000 pounds water capacity, fusible plug)	do	See Note 6	DOT-51	225
Vinyl chloride	84 (see Note 13)	See Note 7	MC-330, MC-331	150
Vinyl fluoride, inhibited	66	do	do	250, see Note 11
Vinyl methyl ether	68	See Notes 7 and 13	do	100

NOTE 1. Maximum filling density for liquefied gases is hereby defined as the percent ratio of the weight of gas in the tank to the weight of water that the tank will hold. For determining the water capacity of the tank in pounds, the weight of a gallon (231 cubic inches) of water at 60° F. in air shall be 8.32828 pounds.

NOTE 2. See § 173.32 for authority to use other portable tanks and for manifolding cargo tanks, see § 173.301(d).

NOTE 3. If cargo tanks and portable tank containers for carbon dioxide, refrigerated liquid and nitrous oxide, refrigerated liquid are designed to comply with the requirements of the ASME Code for Low Temperature Operation, the design pressure may be reduced to 100 p.s.i.g. or the controlled pressure, whichever is greater.

NOTE 4. In the design of tanks for sulfur dioxide and chlorine a corrosion allowance of 20 percent or 0.10 inch, whichever is less, must be added to the metal thickness. In chlorine tanks the wall thickness must be at least five-eighths inch, including corrosion allowance.

NOTE 5. Unlagged cargo tanks and portable tank containers for liquid anhydrous ammonia may be filled to 87.5 percent by volume provided the temperature of the anhydrous ammonia being loaded into such tanks is determined to be not lower than 30° F. or provided the filling of such tanks is stopped at the first indication of frost or ice formation on the outside surface of the tank and is not resumed until such frost or ice has disappeared.

NOTE 6. Tanks equipped with fusible plugs must be filled by weight.

NOTE 7. Tanks must be filled by weight.

NOTE 8. Chlorine cargo tank motor vehicles may be shipped only if the contents are to be unloaded at one unloading point.

NOTE 9. This gas may be transported in authorized cargo tanks and portable tanks marked "DISPERSANT GAS," or "REFRIGERANT GAS."

NOTE 10. [Reserved]

NOTE 11. MC-330, MC-331 and MC-333 cargo tanks must be insulated. Cargo tanks must meet all the following requirements. Each tank must have a design service temperature of minus 100°F., or no warmer than the boiling point at one atmosphere of the hazardous material to be shipped therein, whichever is colder, and must comply with the low-temperature requirements of the ASME Code. When the normal travel time is 24 hours or less, the tank's holding time as loaded must be at least twice the normal travel time. When the normal travel time exceeds 24 hours, the tank's holding time as loaded must be at least 24 hours greater than the normal travel time. The holding time is the elapsed time from loading until venting occurs under equilibrium conditions. The cargo tank must have an outer jacket made of steel when the cargo tank is used to transport a flammable gas.

NOTE 12: No aluminum, copper, silver, zinc, or alloy of any of these metals shall be used in the cargo tank construction where it can come into contact with the lading.

NOTE 13: All parts of valves and safety devices in contact with contents of tank must be of a metal or other material suitably treated if necessary, which will not cause formation of any acetylides.

NOTE 14: Specifications MC 330 and MC 331 cargo tanks constructed of other than quenched and tempered steel "(NQT)" are authorized for all grades of anhydrous ammonia. Specifications MC 330 and MC 331 cargo tanks constructed of quenched and tempered steel "(QT)" (see marking requirements of § 172.328(c) of this subchapter) are authorized for anhydrous ammonia having a minimum water content of 0.2 percent by weight. Any tank being placed in anhydrous ammonia service or a tank which has been in other service or has been opened for inspection, test, or repair, must be cleaned of the previous product and must be purged of air before loading. See § 172.203(h) of this subchapter for special shipping paper requirements.

NOTE 15: Specifications MC 330 and MC 331 cargo tanks constructed of other than quenched and tempered steel (NQT) are authorized for all grades of liquefied petroleum gases. Only grades of liquefied petroleum gases determined to be "noncorrosive" are authorized in Specification MC 330 and MC 331 cargo tanks constructed of quenched and tempered steel (QT). "Noncorrosive" means the corrosiveness of the gas does not exceed the limitations for classification 1 of the ASTM Copper Strip Classifications when tested in accordance with ASTM D1838-64, "Copper Strip Corrosion by Liquefied Petroleum (LP) Gases." (For (QT) and (NQT) marking requirements see § 172.328(c) of this subchapter. For special shipping paper requirements, see § 172.203(h) of this subchapter.)

NOTE 16: Specifications MC 330 and MC 331 cargo tanks must be equipped with emergency discharge controls that comply with § 178.337-11(c) of this subchapter.

NOTE 17: A Specification MC-330 or MC-331 cargo tank or a nonspecification cargo tank meeting, and marked in conformance with, the edition of the ASME Code in effect when it was fabricated, may be used for the transportation of anhydrous ammonia if it:

(1) Has a minimum design pressure not lower than 250 psig;

(2) Was manufactured in conformance with the ASME Code prior to January 1, 1981, according to its ASME name plate and manufacturer's data report;

(3) Is painted white or aluminum;

(4) Complies with Note 12 of this paragraph;

(5) Has been inspected and tested in accordance with § 173.33 as specified for Specification MC-330 or MC-331;

(6) Was used to transport anhydrous ammonia prior to January 1, 1981;

(7) Is operated exclusively in intrastate commerce (including its operation by a motor carrier otherwise engaged in interstate commerce) in a state where its operation was permitted by the laws of that State (not including the incorporation of this subchapter) prior to January 1, 1981; and

(8) Is operated in conformance with all other requirements of this subchapter.

(b) Maximum permitted filling densities for cargo and portable tank containers for transportation of butadiene, inhibited, and liquefied petroleum gas are as follows:

Maximum specific gravity of the liquid material at 60° F	Maximum permitted filling density in percent of the water weight capacity of the tanks (percent) See Note 1	
	1200 gallons or less	Over 1200 gallons
0.473 to 0.480	38	41
0.481 to 0.488	39	42
0.489 to 0.495	40	43
0.496 to 0.503	41	44
0.504 to 0.510	42	45
0.511 to 0.519	43	46
0.520 to 0.527	44	47
0.528 to 0.536	45	48
0.537 to 0.544	46	49
0.545 to 0.552	47	50
0.553 to 0.560	48	51
0.561 to 0.568	49	52
0.569 to 0.576	50	53
0.577 to 0.584	51	54
0.585 to 0.592	52	55
0.593 to 0.600	53	56
0.601 to 0.608	54	57
0.609 to 0.617	55	58
0.618 to 0.626	56	59
0.627 and over	57	60

NOTE 1: Filling is permitted by volume provided the same filling density is used as permitted by weight, except when using fixed length dip tube or other fixed maximum liquid level indicators (paragraph (f) of this section), in which case the maximum permitted filling density shall not exceed 97 percent of the maximum permitted filling density by weight contained in the table.

(1) *Odorization.* All liquefied petroleum gas shall be effectively odorized as required in Note 2 of this paragraph to indicate positively, by a distinctive odor, the presence of gas down to a concentration in air of not over one-fifth the lower limit of combustibility; *Provided, however,* That odorization is not required if harmful in the use or further processing of the liquefied petroleum gas, or if odorization will serve no useful purpose as a warning agent in such use or further processing.

NOTE 1: The lower limits of combustibility of the more commonly used liquefied petroleum gases are: Propane, 2.15 percent; butane, 1.55 percent. These figures represent volumetric percentages of gas-air mixtures in each case.

NOTE 2: The use of 1.0 pound of ethyl mercaptan, 1.0 pound of thiophane, or 1.4 pounds of amyl mercaptan per 10,000 gallons of liquefied petroleum gas shall be considered sufficient to meet the requirements of § 173.315(b)(1). This note does not exclude the use of any other odorant in sufficient quantity to meet the requirements of § 173.315(b)(1).

(c) Except as otherwise provided, the loading of a liquefied gas into a cargo tank or a portable tank shall be determined by weight or by a suitable liquid level gauging device. The liquid portion of the gas shall not fill the tank

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at 105°F. if the tank is lagged, or at 115°F. if the tank is unlagged, except that this requirement shall not apply to:

(1) A tank containing carbon dioxide, refrigerated liquid or nitrous oxide, refrigerated liquid. Such tank is required to be equipped with suitable pressure control valves and may not be filled to a level exceeding 95 percent of the volumetric capacity of the tank.

(2) A tank containing ethane, refrigerated liquid; ethane-propane mixture, refrigerated liquid; or hydrogen chloride, refrigerated liquid. Such tank must be filled to allow at least two percent outage below the inlet of the pressure relief valve or pressure control valve under conditions of incipient opening, with the tank in a level attitude.

(d) If the loading of cargo tanks and portable tank containers with liquefied gases is to be determined by weight, the gross weight shall be checked after the filling line is disconnected in each instance. The gross weight shall be calculated from the tank capacity and tare weight set forth on the metal plate required by the specification, and the maximum filling density permitted for the material being loaded into the tank as set forth in the table, paragraph (a)(1) of this section.

(e) If the loading of cargo tanks and portable tank containers with liquefied gases is to be determined by adjustable liquid level device, each tank and each compartment thereof shall have a thermometer well, so that the internal liquid temperature can easily be determined, and the amount of liquid in the tank shall be corrected to a 60° F. basis. Liquid levels shall not exceed a level corresponding to the maximum filling density permitted for the material being loaded into the tank as set forth in the table in paragraph (a)(1) of this section.

(f) When the loading of cargo tanks and portable tank containers with liquefied gases is determined only by fixed length dip tube or other fixed maximum liquid level indicator, the device shall be arranged to function at a level not to exceed the maximum permitted volume prescribed by the table, paragraph (a)(1) of this section. Loading shall be stopped when the device functions.

(g) Containers, the liquid level of which has been determined by means of a fixed length dip tube gauging device, shall not be acceptable for stowage as cargo on vessels in commerce subject to the jurisdiction of the United States Coast Guard. Nothing contained in this section shall be so construed as to prohibit the transportation on car floats or car ferries of motor vehicles laden with containers nor cargo tanks the liquid level of either of which has been determined by means of fixed length dip tube devices.

(h) Each cargo tank and portable tank, except a tank filled by weight, must be equipped with one or more of the gauging devices described in the following table which indicate accurately the maximum permitted liquid level. Additional gauging devices may be installed but may not be used as primary controls for filling of cargo tanks and portable tanks. Gauge glasses are not permitted on any cargo tank or portable tank. Primary gauging devices used on cargo tanks of less than 3500 gallons water capacity are exempt from the longitudinal location requirements specified in paragraphs (h)(2) and (3) of this section provided: The tank length does not exceed three times the tank diameter; and the cargo tank is unloaded within 24 hours after each filling of the tank.

Kind of gas	Gaging device permitted for filling purposes
Anhydrous ammonia	Rotary tube; adjustable slip tube; fixed length dip tube
Anhydrous dimethylamine	None
Anhydrous monomethylamine	Do
Anhydrous trimethylamine	Do
Aqua ammonia solution containing anhydrous ammonia	Rotary tube; adjustable slip tube; fixed length dip tube
Butadiene, inhibited	Do
Carbon dioxide, refrigerated liquid	Do
Chlorine	None
Dichlorodifluoromethane	Do
Difluoroethane	Do
Difluoromonochloroethane	Do
Dimethyl ether	Do
Ethane, refrigerated liquid	Rotary tube; adjustable slip tube; fixed length dip tube
Ethane-propane mixture, refrigerated liquid	Do

Kind of gas	Gauging device permitted for filling purposes
Hexafluoropropylene	None.
Hydrogen chloride, refrigerated liquid	Do.
Liquefied petroleum gases	Rotary tube; adjustable slip tube; fixed length dip tube.
Methyl chloride	Fixed length dip tube.
Methyl mercaptan	Rotary tube; adjustable slip tube; fixed length dip tube.
Monochlorodifluoromethane	None.
Nitrous oxide, refrigerated liquid	Rotary tube; adjustable slip tube; fixed length dip tube.
Methylacetylene-propadiene, stabilized	Do.
Refrigerant gas, n.o.s. or Dispersant gas, n.o.s.	None.
Sulfur dioxide	Fixed length dip tube.
Vinyl chloride	None.
Vinyl fluoride, inhibited	Do.

(1) The design pressure of the liquid level gauging devices shall be at least equal to the design pressure of the tank.

(2) If the primary gauging device is adjustable, it must be capable of adjustment so that the end of the tube will be in the location specified in paragraph (h)(3) of this section for at least one of the ladings to be transported, at the filling level corresponding to an average loading temperature. Exterior means must be provided to indicate this adjustment. The gauging device must be legibly and permanently marked in increments not exceeding 20 Fahrenheit degrees (or not exceeding 25 p.s.i.g. on tanks for carbon dioxide, refrigerated liquid or nitrous oxide, refrigerated liquid), to indicate the maximum levels to which the tank may be filled with liquid at temperatures above 20° F. However, if it is not practicable to so mark the gauging device, this information must be legibly and permanently marked on a plate affixed to the tank adjacent to the gauging device.

(3) A dip tube gauging device consists of a pipe or tube with a valve at its outer end with its intake limited by an orifice not larger than 0.060 inch in diameter. If a fixed length dip tube is used, the intake must be located midway of the tank both longitudinally and laterally and at maximum permitted filling level. In tanks for liquefied petroleum gases, the intake must be located at the level reached by the lading when the tank is loaded to maximum filling density at 40° F.

(4) Each opening for a pressure gauge, except on a tank used exclusively for the transportation of carbon dioxide, refrigerated liquid or nitrous oxide, refrigerated liquid must be restricted at or inside the tank by an orifice no larger than 0.060 inch in diameter.

(i) Each tank must be provided with one or more safety relief devices which, unless otherwise specified in this part, must be safety relief valves of the spring-loaded type. Each valve must be arranged to discharge upward and unobstructed to the outside of the protective housing to prevent any impingement of escaping gas upon the tank. For each chlorine tank the protective housing must be in compliance with the requirements set forth in the applicable specification.

(1) Safety relief valves on each tank must have a total relieving capacity as determined by the flow formulas contained in CGA Pamphlet S-1.2. Safety relief valves must have a total relieving capacity sufficient to prevent a maximum pressure in the tank of more than 120 percent of the design pressure. For an insulated tank the required relieving capacity of the relief valves must be the same as for an uninsulated tank, unless the insulation will remain in place and will be effective under fire conditions. In this case, each insulated tank must be covered by a sheet metal jacket of not less than 16 gauge thickness. An MC 330 cargo tank that has safety relief valves sized by Fetterly's formula dated November 27, 1928, may be continued in service. Copies of this formula may be obtained from the Bureau of Explosives.

(2) Each safety relief valve must be arranged to minimize the possibility of tampering. If the pressure setting or adjustment is external to the valve, the safety relief valve must be provided with means for sealing the adjustment and it must be sealed.

(3) Each safety relief valve on a tank must be set to start-to-discharge at pressure no higher than 110 percent of the tank design pressure and no lower than the design pressure specified in

paragraph (a)(1) of this section for the gas transported.

(4) Each safety relief valve must be plainly and permanently marked with the pressure in p.s.i.g. at which it is set to discharge, with the actual rate of discharge of the device in cubic feet per minute of the gas or of air at 60° F. and 14.7 p.s.i.a., and with the manufacturer's name or trade name and catalog number. The start-to-discharge valve must be visible after the valve is installed. The rated discharge capacity of the device must be determined at a pressure of 120 percent of the design pressure of the tank.

(5) Each safety relief valve must have direct communication with the vapor space in the tank.

(6) Each connection to a safety relief valve must be of sufficient size to provide the required rate of discharge through the safety relief valve.

(7) No shut-off valve may be installed between a safety relief valve and the tank except in cases where two or more safety relief valves are installed on the same tank, and one or more safety shut-off valves are arranged to always provide the required relief capacity through at least one of the safety relief valves.

(8) Each safety relief valve outlet must be provided with a protective device to prevent the entrance and accumulation of dirt and water. This device must not impede flow through the valve.

(9) On tanks for carbon dioxide, refrigerated liquid or nitrous oxide, refrigerated liquid each safety relief device must be installed and located so that the cooling effect of the contents will not prevent the effective operation of the device. In addition to the required safety relief valves, these tanks may be equipped with one or more pressure controlling devices.

(10) Each tank for carbon dioxide, refrigerated liquid also may be equipped with one or more frangible disc devices set to function at a pressure not over two times nor less than 1.5 times the design pressure of the tank.

(11) Each portion of connected liquid piping or hose that can be closed at both ends must be provided with a safety relief valve without an intervening shut-off valve to prevent excessive hydrostatic pressure that could burst the piping or hose.

(12) Subject to conditions of paragraph (a)(1) of this section for the methyl chloride and sulfur dioxide optional portable tanks, one or more fusible plugs examined by the Bureau of Explosives and approved by the Director, OHMT may be used on these tanks in place of safety relief valves of the spring-loaded type. The fusible plug or plugs must be in accordance with CGA Pamphlet S-1.2, to prevent a pressure rise in the tank of more than 120 percent of the design pressure. If the tank is over 30 inches long, each end must have the total specified safety discharge area.

(13) A safety relief valve on a chlorine tank motor vehicle must conform to one of the following standards of The Chlorine Institute, Inc.: Type 1½ JQ225, Dwg H51970, dated October 7, 1968; or Type 1½ JQ225, Dwg. H50155, Revision A, dated April 28, 1969.

(j) Storage containers for liquefied petroleum gas for permanent installation on consumer premises may be shipped by private motor carrier only under the following conditions:

(1) Each container must be constructed in compliance with the requirements of the ASME Code (containers built in compliance with earlier editions starting with 1943 are authorized) and must be marked to indicate compliance in the manner specified by the respective Code.

(2) Each container must be equipped with safety devices in compliance with the requirements for safety devices on containers as specified in NFPA Pamphlet No. 58.

(3) The containers shall be so braced or otherwise secured on the vehicle as to prevent relative motion while in transit. Valves or other fittings shall be adequately protected against injury during transportation. (See § 177.834(g) of this subchapter.)

(4) Except as provided in paragraph (j)(5) of this section, containers shall not be shipped when charged with liquefied petroleum gas to more than 5 percent of their water capacity.

(5) Storage containers of less than 1,042 pounds water capacity (125 gallons) may be shipped when charged

with liquefied petroleum gas in compliance with DOT filling density.

(k) A nonspecification cargo tank meeting, and marked in conformance with, the edition of the ASME Code in effect when it was fabricated, may be used for the transportation of liquefied petroleum gas if it:

(1) Has a minimum design pressure no lower than 250 psig;

(2) Has a capacity of 3,500 gallons or less;

(3) Was manufactured in conformance with the ASME Code prior to January 1, 1981, according to its ASME name plate and manufacturer's data report;

(4) Conforms to NFPA Pamphlet 58;

(5) Has been inspected and tested in accordance with § 173.33 as specified for Specification MC-330 or MC-331;

(6) Is operated exclusively in intrastate commerce (including its operation by a motor carrier otherwise engaged in interstate commerce) in a state where its operation was permitted by the laws of that State (not including the incorporation of this subchapter) prior to January 1, 1981;

(7) Was used to transport liquefied petroleum gas prior to January 1, 1981; and

(8) Is operated in conformance with all other requirements of this subchapter.

(l) Anhydrous ammonia must not be offered for transportation or transported in specification MC 330 and MC 331 cargo tanks constructed of quenched and tempered ("QT") steel except as provided in this paragraph.

(1) The ammonia must have a minimum water content of 0.2 percent by weight. Any addition of water must be made using steam condensate, deionized, or distilled water.

(2) Except as otherwise provided in this paragraph, each person offering for transportation or transporting anhydrous ammonia shall perform a periodic analysis for prescribed water content in the ammonia. The analysis must be performed:

(i) From a sample of the ammonia in storage taken at least once every 7 days, or each time ammonia is added to the storage tanks, whichever is less frequent, or

(ii) At the time the cargo tanks are loaded, then a sample of the ammonia taken from at least one loaded cargo tank out of each 10 loads, or from one cargo tank every 24 hours, whichever is less frequent; or

(iii) At the same frequency as described in paragraph (l)(2)(ii) of this section, from a sample taken from the loading line to the cargo tank.

(3) If water is added at the time of loading:

(i) The sample for analysis must be taken from a point in the loading line between the water injection equipment and the cargo tank; and

(ii) Positive provisions must be made to assure water injection equipment is operating.

(4) If water injection equipment becomes inoperative, suitable corrective maintenance must be performed after which a sample from the first loaded cargo tank must be analyzed for prescribed water content.

(5) The analysis method for water content must be as prescribed in CGA Pamphlet G-2.2, titled "Tentative Standard Method for Determining Minimum of 0.2 per cent water in Anhydrous Ammonia," 1975 edition.

(6) Records indicating the results of the analysis taken, as required by this paragraph, must be retained for 2 years and must be open to inspection by representative of the Department.

(7) Each person receiving anhydrous ammonia containing 0.2 per cent water by weight may offer for transportation or transport that ammonia without performing the prescribed analysis for water content provided:

(i) The ammonia received was certified as containing 0.2 percent water as prescribed in §§ 172.203(h)(1)(i) and 177.817(a) of this subchapter; and

(ii) The amount of water in the ammonia has not been reduced by any means.

(m) A cargo tank (commonly known as a nurse tank and considered an implement of husbandry) transporting anhydrous ammonia, and operated by a private carrier exclusively for agricultural purposes does not have to meet the specification requirements of Part 178 of this subchapter if it:

(1) Has a minimum design pressure of 250 psig and meets the require-

ments of the edition of the ASME code in effect at the time it was manufactured and is marked accordingly;

(2) Is equipped with safety relief valves meeting the requirements of CGA pamphlet S1.2;

(3) Is painted white or aluminum;

(4) Has capacity of 3,000 gallons or less;

(5) Is loaded to a filling density no greater than 56 percent;

(6) Is securely mounted on a farm wagon; and

(7) Is operated in conformance with the requirements of Part 172 of this subchapter except that shipping papers are not required.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53(e), App. A to Part 1)

[29 FR 18743, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.315, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.316 Cryogenic liquids in cylinders.

(a) *General requirements.* (1) A cylinder may not be loaded with a cryogenic liquid colder than the design service temperature of the packaging.

(2) A cylinder may not be loaded with any material which may combine chemically with any residue in the packaging to produce an unsafe condition.

(3) The jacket covering the insulation on a cylinder used to transport any flammable cryogenic liquid must be made of steel.

(4) A valve or fitting made of aluminum with internal rubbing or abrading aluminum parts that may come in contact with oxygen in the cryogenic liquid form may not be installed on any cylinder used to transport oxygen, cryogenic liquid unless the parts are anodized in accordance with ASTM Standard B 580.

(5) An aluminum valve, pipe or fitting may not be installed on any cylinder used to transport any flammable cryogenic liquid.

(6) Each cylinder must be provided with one or more pressure relief devices, which must be installed and maintained in compliance with the requirements of this subchapter.

(7) Each pressure relief device must be installed and located so that the cooling effect of the contents during venting will not prevent effective operation of the device.

(8) The maximum weight of the contents in a cylinder with a design service temperature colder than −320° F. may not exceed the design weight marked on the cylinder (see § 178.57-20(a)(4) of this subchapter).

(b) *Pressure control systems.* Each cylinder containing a cryogenic liquid must have a pressure control system that conforms to § 173.34(d) and is designed and installed so that it will prevent the cylinder from becoming liquid full.

(c) *Specification cylinder requirements and filling limits.* Specification DOT-4L cylinders (§ 178.57 of this subchapter) are authorized for the transportation of cryogenic liquids when carried in the vertical position as follows:

(1) For purposes of this section, "filling density," except for hydrogen, is defined as the percent ratio of the weight of lading in the packaging to the weight of water that the packaging will hold at 60° F. (1 lb. of water = 27.737 cubic inches at 60° F.).

(2) The cryogenic liquids of argon, nitrogen, oxygen, helium and neon must be loaded and shipped in accordance with the following table:

Pressure control valve setting (maximum start-to-discharge pressure psig)	Maximum permitted filling density (percent by weight)				
	Argon	Nitrogen	Oxygen	Helium	Neon
45	133	76	108	12.5	109
75	130	74	105	12.5	104
105	127	72	103	12.5	100
170	122	70	100	12.5	92
230	119	69	98	12.5	85
295	115	68	96	12.5	77
360	113	65	93	12.5	
450	111	61	91	12.5	
540	107	58	88	12.5	
625	104	55	86	12.5	
Design service temperature (° F)	320	320	320	452	411

(3) *Hydrogen (minimum 95 percent parahydrogen)* must be loaded and shipped as follows:

Column 1	Column 2
Design service temperature	Minus 423° F or colder
Maximum permitted filling density, based on cylinder capacity at minus 423° F (see Note 1)	6.7 percent
The pressure control valve must be designed and set to limit the pressure in the cylinder to not more than	17 psig

NOTE 1: The filling density for hydrogen, cryogenic liquid is defined as the percent ratio of the weight of lading in a packaging to the weight of water that the packaging will hold at minus 423° F. The volume of the packaging at minus 423° F is determined in cubic inches. The volume is converted to pounds of water (1 lb. of water = 27.737 cubic inches).

(i) Each cylinder must be constructed, insulated and maintained so that during transportation the total rate of venting shall not exceed 30 SCF of hydrogen per hour.

(ii) In addition to the marking requirements in § 178.57-20 of this subchapter, the total rate of venting in SCF per hour (SCFH) shall be marked on the top head or valve protection band in letters at least one-half inch high as follows: "VENT RATE**SCFH" (with the asterisks replaced by the number representing the total rate of venting, in SCF per hour).

(iii) Carriage by highway is subject to the conditions specified in § 177.840(a) of this subchapter.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 173-166, 48 FR 27695, June 16, 1983, as amended by Amdt. 173-166, 49 FR 24314, June 12, 1984; Amdt. 173-180, 49 FR 42735, Oct. 24, 1984]

§ 173.318 Cryogenic liquids in cargo tanks.

(a) *General requirements.* (1) A cargo tank may not be loaded with a cryogenic liquid colder than the design service temperature of the packaging.

(2) A cargo tank may not be loaded with any material that may combine chemically with any residue in the packaging to produce an unsafe condition (see § 178.338-15).

(3) The jacket covering the insulation on a tank used to transport a cryogenic liquid must be made of steel if the cryogenic liquid:

(i) Is to be transported by vessel (see § 176.76(h)(1) of this subchapter); or

(ii) Is oxygen or a flammable material.

(4) A valve or fitting made of aluminum with internal rubbing or abrading aluminum parts that may come in contact with oxygen in the cryogenic liquid form may not be installed on any cargo tank used to transport oxygen, cryogenic liquid unless the parts are anodized in accordance with ASTM Standard B 580.

(5) An aluminum valve, pipe or fitting, external to the jacket that retains lading during transportation may not be installed on any cargo tank used to transport oxygen, cryogenic liquid or any flammable cryogenic liquid.

(6) A cargo tank used to transport oxygen, cryogenic liquid must be provided with a manhole (see § 178.338-6 of this subchapter).

(b) *Pressure relief devices and pressure control valves*—(1) *General requirements.* (i) Except as otherwise provided in this paragraph, each tank must be protected by a primary system of one or more pressure relief valves and a secondary system of one or more frangible discs or pressure relief valves. For a tank in carbon monoxide service, the secondary system must be pressure relief valves. For a tank used in atmospheric gas (except oxygen) or helium service, an alternate pressure relief system consisting of at least one pressure relief valve is authorized. The discharge from any pressure relief system must be directed upward and unobstructed to the outside of the protective housing in such a manner as to prevent impingement of gas upon the jacket or any structural part of the vehicle. Pressure relief valves must be of the type that automatically open and close at a predetermined pressure.

(ii) Each pressure relief device must be designed and constructed for a pressure equal to or exceeding the tank's design pressure at the coldest temperature reasonably expected to be encountered.

(iii) The rated relieving capacity for each pressure relief valve, pressure control valve when used as a pressure relief valve, and frangible disc must be as determined by the flow formulas contained in paragraph (b)(2)(i) of this section.

(iv) Each pressure relief valve must be designed and located to minimize the possibility of tampering. If the pressure setting or adjustment is external to the valve, the valve adjustement must be sealed.

(v) Each pressure relief device must have direct communication with the vapor space of the tank at the midlength of the top centerline

(vi) Each connection to a pressure relief device must be of sufficient size to allow the required rate of discharge through the pressure relief device.

(vii) No shut-off valve may be installed between a pressure relief device and the tank except when two or more pressure relief valves or two or more frangible discs are installed on the same tank. In that case, one or more shut-off valves may be so installed if the installation is arranged to allow the required relief capacity at all times through at least one pressure relief valve and at least one frangible disc.

(viii) Each pressure relief valve must be arranged or protected to prevent the accumulation of foreign material between the relief valve and the atmospheric discharge opening in any relief piping. The arrangement or protection must not impede flow through the device.

(ix) Each pressure relief device must be installed and located so that the cooling effect of the contents during venting will not prevent the effective operation of the device.

(2) *Capacity and performance*—(i) *Capacity of pressure relief systems*—(A) *Tanks in oxygen or flammable cryogenic liquid service.* The primary system of pressure relief valves and the secondary system of relief devices must each have a flow capacity equal to or greater than that calculated by the applicable formula in paragraph 5.3.2. or paragraph 5.3.3. of CGA Pamphlet S-1.2.

(B) *Tanks in atmospheric gas (except oxygen) and helium, cryogenic liquid service.* The pressure relief system must have a flow capacity equal to or greater than that calculated by the applicable formula in paragraph 5.3.2 or paragraph 5.3.3 of CGA Pamphlet S-1.2.

(ii) The primary system of pressure relief valves must have the minimum total capacity specified in paragraph (b)(2)(i) of this section, at a pressure not exceeding 120 percent of the tank design pressure.

(iii) The alternate pressure relief system and secondary system of frangible discs or additional pressure relief valves must have the minimum total capacity specified in paragraph (b)(2)(i) of this section, at a pressure not exceeding 150 percent of the tank design pressure.

(iv) The primary system of pressure relief valves must have a liquid flow capacity rated at a pressure not exceeding 120 percent of the tank design pressure, that is equal to or exceeding the maximum rate at which the tank is to be filled. However, a rating pressure not exceeding 150 percent of the tank design pressure is authorized on a tank used in atmospheric gas (except oxygen) and helium, cryogenic liquid service when equipped with the alternate pressure relief system.

(v) Each primary pressure relief valve must have a set pressure no higher than 110 percent of the tank design pressure.

(vi) The secondary system of pressure relief devices must be designed to commence functioning at a pressure no lower than 130 percent and no higher than 150 percent of the tank design pressure.

(3) *Pressure relief devices for piping, hose and vacuum-insulated jackets.* (i) Each portion of connected liquid piping or hose that can be closed at both ends must be provided with either a hydrostatic pressure relief valve without an intervening shut-off valve, or a check valve permitting flow from the pipe or hose into the tank. If used, the relief valve must be located so as to prevent its discharge from impinging on the tank, piping, or operating personnel.

(ii) On a vacuum-insulated cargo tank the jacket must be protected by a suitable relief device to release internal pressure. The discharge area of this device must be at least 0.00024 square inch per pound of water capacity of the tank. This relief device must function at a pressure not exceeding the internal design pressure of the jacket, calculated in accordance with the ASME Code, or 25 psig, whichever is less.

(4) *Optional pressure relief devices and pressure control valves.* (i) In addition to the required pressure relief devices, a cargo tank may be equipped with one or more pressure control valves if they meet applicable requirements contained in this part.

(ii) In addition to the required pressure relief devices, a cargo tank may be equipped with one or more frangible discs set to function at a pressure not less than one and one-half times or more than two times the tank design pressure.

(5) *Tank inlet, outlet, pressure relief device and pressure control valve markings.* (i) Each tank inlet and outlet, except pressure relief devices and pressure control valves, must be permanently marked to indicate whether it communicates with "vapor" or "liquid" when the tank is filled to the maximum permitted filling density.

(ii) Each pressure relief valve must be plainly and permanently marked with the pressure, in psig, at which it is set-to-discharge, the discharge rate of the device in SCF per minute (SCFM) of free air, and the manufacturer's name or trade name and catalog number. The marked set-to-discharge pressure value must be visible with the valve in its installed position. The rated discharge capacity of the device must be determined at a pressure of 120 percent of the design pressure of the tank.

(iii) Each pressure control valve must be plainly and permanently marked with the pressure, in psig, at which it is set-to-discharge.

(c) *Weight of lading requirements.* The weight of a cryogenic liquid in the tank must be determined by weighing or by the use of a liquid level gauging device authorized in § 178.338-14(a) of this subchapter, and may not exceed the lesser of:

(1) The weight of lading in the tank, based on the water capacity stamped on the nameplate (§ 178.338-18(a)(4) of this subchapter) and the appropriate maximum permitted filling density specified in paragraph (f) of this section; or

(2) The maximum weight of lading for which the cargo tank was designed, as marked on the specification plate (see § 178.338-18(b) of this subchapter).

(d) *Outage.* Except for a cargo tank containing helium, cryogenic liquid, a cargo tank offered for transportation must have an outage of at least two percent below the inlet of the pressure relief device or pressure control valve, under conditions of incipient opening, with the tank in a level attitude.

(e) *Temperature.* A flammable cryogenic liquid in a cargo tank at the start of travel must be at a temperature sufficiently cold that the pressure setting of the pressure control valve or the required pressure relief valve, whichever is lower, will not be reached in less time than the marked rated holding time for the cryogenic liquid (see §§ 173.33(d)(1)(ii) and 178.338-9(b) of this subchapter).

(f) *Specification MC-338 (§ 178.338 of this subchapter) cargo tanks* are authorized for the shipment of the following cryogenic liquids subject to the following additional requirements:

(1) For purposes of this section, "filling density" is defined as the percent ratio of the weight of lading in the tank to the weight of water that the tank will hold at the design service temperature (one pound of water = 27.737 cubic inches at 60° F., or one gallon of water = 231 cubic inches at 60° F. and weighs 8.32828 pounds).

(2) *Argon, helium, nitrogen, and oxygen, cryogenic liquids* must be loaded and shipped in accordance with the following table:

PRESSURE CONTROL VALVE SETTING OR RELIEF VALVE SETTING

Maximum set-to-discharge pressure (psig)	Maximum permitted filling density (percent by weight)			
	Argon	Helium	Nitrogen	Oxygen
26		12.5		
30	129	12.5	74	105
40		12.5		
50		12.5		
55	125	12.5	71	102
60		12.5		
80		12.5		
85	121	12.5		99
100		12.5		
105		12.5	67	
120		12.5		
140		12.5		
145	115	12.5	64	94
180		12.5		
200	110	12.5	61	91
250	106	12.5	57	87
275	105	12.5	56	86
325	101		53	83
Design service temperature	Minus 320° F	Minus 452° F	Minus 320° F	Minus 320° F

(3) *Carbon monoxide, hydrogen (minimum 95 percent para-hydrogen), ethylene, and methane or natural gas, cryogenic liquids* must be loaded and shipped in accordance with the following table:

PRESSURE CONTROL VALVE SETTING OR RELIEF VALVE SETTING

Maximum set-to-discharge pressure (psig)	Maximum permitted filling density (percent by weight)			
	Carbon monoxide	Ethylene	Hydrogen	Methane or natural gas
10			6.6	
15	75.0		6.6	40.5
17	74.0		6.6	
20		53.5		40.0
25	73.0			
30	72.0	52.7	6.3	39.1
35				
40		52.0		38.6
45	71.5			
50		51.4	6.0	38.2
55				
60		50.8		
70		50.2	5.7	37.5
90		49.2		
95				
100		48.4	5.4	36.6
115		48.2		
125			5.0	
175	62.5	45.8		
285	56.0			

PRESSURE CONTROL VALVE SETTING OR RELIEF VALVE SETTING—Continued

Maximum set-to-discharge pressure (psig)	Maximum permitted filling density (percent by weight)			
	Carbon monoxide	Ethylene	Hydrogen	Methane or natural gas
Design service temperature	Minus 320° F	Minus 155° F	Minus 423° F	Minus 260° F

(g) *One-way travel time; marking.* The jacket of a cargo tank to be used to transport a flammable cryogenic liquid must be marked on its right side near the front, in letters and numbers at least two inches high, "One-Way-Travel-Time —— hrs.", with the blank filled in with a number indicating the one-way travel time (OWTT), in hours, of the cargo tank for the flammable cryogenic liquid to be transported. A cargo tank that is partially unloaded at one or more locations must have additional marking "One-Way-Travel-Time —— hrs. —— psig to —— psig at —— percent filling density," with the second blank filled in with the pressure existing after partial unloading and the third blank filled in with the set-to-discharge pressure of the control valve or pressure relief valve, and the fourth blank with the filling density following partial unloading. Multiple OWTT markings for different pressure levels are permitted.

(1) OWTT is based on the marked rated holding time (MRHT) of the cargo tank for the cryogenic liquid to be transported in the cargo tank. If the MRHT for the flammable cryogenic liquid is not displayed on or adjacent to the specification plate, this MRHT may be derived.

(2) The MRHT is converted to OWTT, in hours, as follows:

(i) For a tank with an (MRHT) of 72 hours or less,

OWTT=(MRHT-24)/2

(ii) For a tank with an MRHT greater than 72 hours,

OWTT=MRHT−48

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 173-166, 48 FR 27696, June 16, 1983; 48 FR 50440, 50442, Nov. 1, 1983, as amended by Amdt. 173-166, 49 FR 24315, June 12, 1984; Amdt. 173-180, 49 FR 42735, Oct. 24, 1984]

§ 173.319 Cryogenic liquids in tank cars.

(a) *General requirements.* (1) A tank car containing a flammable cryogenic liquid may not be shipped unless it was loaded by, or with the consent of, the owner of the tank car.

(2) The amount of flammable cryogenic liquid loaded into a tank car must be determined, either by direct measurement or by calculation based on weight, to verify that the tank has not been filled to a level in excess of the limits specified in paragraph (d)(2) of this section. The weight of any flammable cryogenic liquid loaded, except hydrogen, must be checked by use of scales after disconnecting the loading line.

(3) Whenever a tank car containing any flammable cryogenic lading is not received by the consignee within 20 days from the date of shipment, the shipper of the lading shall notify the Bureau of Explosives.

(4) A tank car may not be loaded with any flammable cryogenic liquid:

(i) That may combine chemically with any residue in the tank to produce an unsafe condition,

(ii) That is colder than the design service temperature of the tank,

(iii) If the average daily pressure rise in the tank exceeded 3 psi during the prior shipment (see § 173.31(c)(13)),

(iv) Unless it is marked with the name of contents, in accordance with § 172.330 of this subchapter.

(b) When a tank car containing a flammable cryogenic liquid is offered for transportation:

(1) At least 0.5 percent outage must be provided below the inlet of the pressure relief or pressure control valve at the start-to-discharge pressure setting of the valve, with the tank car in a level attitude, and

(2) The absolute pressure in the annular space must be less than 75 microns of mercury.

(c) *Temperature.* A flammable cryogenic liquid must be loaded into a tank car at such a temperature that the average daily pressure rise during transportation will not exceed 3 psi (see paragraph (a)(4)(iii) of this section and § 173.31(c)(13)).

(d) A Class DOT-113 tank car is authorized for the shipment of the following cryogenic liquids subject to the following additional requirements:

(1) For purposes of this section, "filling density" is defined as the percent ratio of the weight of lading in the tank to the weight of water that the tank will hold at the design service temperature (one pound of water = 27.737 cubic inches at 60° F., or one gallon of water = 231 cubic inches at 60° F. and weighs 8.32828 pounds).

(2) *Ethylene, and hydrogen (minimum 95 percent parahydrogen), cryogenic liquids* must be loaded and shipped in accordance with the following table:

PRESSURE CONTROL VALVE SETTING OR RELIEF VALVE SETTING

Maximum start-to-discharge pressure (psig)	Maximum permitted filling density (percent by weight)			
	Ethylene	Ethylene	Ethylene	Hydrogen
17				6.60
45	52.8			
75		51.1	51.1	
Maximum pressure when offered for transportation	10 psig	10 psig	20 psig	
Design service temperature	Minus 260° F	Minus 260° F	Minus 155° F	Minus 423° F
Specification (see § 173.31(a)(9))	113D60W 113C60W	113C120W	113D120W	113A175W 113A60W

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 173-166, 48 FR 27698, June 16, 1983]

§ 173.320 Cryogenic liquids; exceptions.

(a) Atmospheric gases and helium, cryogenic liquids, in Dewar flasks, insulated cylinders, insulated portable tanks, insulated cargo tanks and insulated tank cars, designed and constructed so that the pressure in such packagings will not exceed 25.3 psig under ambient temperature conditions during transportation are not subject to the requirements of this subchapter when transported by motor vehicle or railcar except as specified in paragraphs (a)(1) and (a)(2) of this section.

(1) Sections 171.15 and 171.16 of this subchapter pertaining to the reporting of incidents, not including a release that is the result of venting through a pressure control valve, or the neck of the Dewar flask.

(2) Subparts A, B, C, and D of Part 172, §§ 174.24 (for rail) and 177.817 for highway) and in addition, Part 172 in its entirety for oxygen.

(3) The requirements of this subchapter do not apply to atmospheric gases and helium:

(i) During loading and unloading operations (pressure rises may exceed 25.3 psig); or

(ii) When used in operation of a process system; such as a refrigeration system.

(b) For transportation aboard aircraft, see § 171.11 of this subchapter.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 173-166, 48 FR 27698, June 16, 1983, as amended by Amdt. 173-166, 49 FR 24315, June 13, 1984; Amdt. 173-180, 49 FR 42736, Oct. 24, 1984]

Subpart H—Poisonous Materials, Etiologic Agents, and Radioactive Materials; Definitions and Preparation

§ 173.325 Classes of poisonous materials.

(a) Poisonous materials for the purpose of this subchapter are divided into three groups according to the degree of hazard in transportation.

(1) Poison A.

(2) Poison B.

(3) Irritating material.

[Amdt. 173-94, 41 FR 16081, Apr. 15, 1976]

§ 173.326 Poison A.

(a) For the purpose of Parts 170-189 of this subchapter extremely dangerous poisons, Class A, are poisonous gases or liquids of such nature that a very small amount of the gas, or vapor of the liquid mixed with air is dangerous to life. This class includes the following:

(1) Bromacetone.

(2) Cyanogen.

(3) Cyanogen chloride containing less than 0.9 percent water.

(4) Diphosgene.

(5) Ethyldichlorarsine.

(6) Hydrocyanic acid (see Note 1 of this paragraph).

(7) [Reserved]

(8) Methyldichlorarsine.

(9) [Reserved]

(10) Nitrogen peroxide (tetroxide).

(11) [Reserved]

(12) Phosgene (diphosgene).

(13) Nitrogen tetroxide-nitric oxide mixtures containing up to 33.2 percent weight nitric oxide.

NOTE 1: Diluted solutions of hydrocyanic acid of not exceeding 5 percent strength are classed as poisonous articles, Class B (see § 173.343).

(b) Poisonous gases or liquids, Class A, as defined in paragraph (a) of this section, except as provided in § 173.331, must not be offered for transportation by rail express.

[29 FR 18753, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16081, Apr. 15, 1976; Amdt. 173-94A, 41 FR 40683, Sept. 20, 1976]

§ 173.327 General packaging requirements for Poison A materials.

(a) Cylinders must be maintained in compliance with the requirements of § 173.34. Valves must be capable of withstanding the test pressure of the cylinders and must have taper-threaded connections directly to the cylinders (no bushings or straight-threaded connections of valves to cylinders permitted). For corrosive commodities, valves may be of the packed type provided the assembly is made gas-tight by means of a seal cap with compatible gasketed joint to the valve body or to the cylinder to prevent loss of commodity through or past the packing;

otherwise the valves must be of the packless type with nonperforated diaphragms and handwheels. Each valve outlet must be sealed by a threaded cap or a threaded solid plug. The outlet caps and plugs, luting, and gaskets must be compatible with each other, the valve assembly, and the lading.

(1) The pressure of the poison gas at 130° F. must not exceed the service pressure of the cylinder. Cylinders must not be liquid full at 130° F.

(2) Cylinders packed in boxes must have adequate protection for valves. Box and valve protection must be of strength sufficient to protect all parts of cylinders and valves from deformation or breakage resulting from a drop of at least 6 feet onto a concrete floor, impacting at the weakest point. A cylinder not overpacked in a box must be equipped with a protective cap or other means of valve protection which must be capable of preventing damage to or distortion of the valve if it were subjected to an impact test as follows: The cylinder, prepared as for shipment, is allowed to fall from an upright position with the side of the cap or other valve protection striking a solid steel object projecting not more than 6 inches above the floor level.

(b) Closing and cushioning. All containers must be tightly and securely closed. Inside containers must be cushioned as prescribed, or in any case when necessary to prevent breakage or leakage.

(c) No Class A poisons in cargo tanks. No "extremely dangerous poison, class A," may be loaded into or transported in any cargo tank.

(d) It shall not be permissible to transport class A poison if there be any interconnecting means of any character between the containers.

(e) Unless otherwise specified in this subchapter, packaging used for the transportation of any Poison A material may not be completely filled. Sufficient outage must be provided so that the packaging will not be liquid full at 130° F. (55° C.).

(f) Each tank car, except series 106A*** and 110A***, containing Poison A materials must be marked with the name of contents (§ 172.101 of this subchapter) in accordance with the requirements of § 172.330 of this subchapter.

[29 FR 18753, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.327, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.328 Poison A materials not specifically provided for.

(a) Poison A materials, as defined in § 173.326, other than those for which special packaging requirements are prescribed in this part, must be packaged as follows:

(1) Specification 33[1] or 3D[1] metal cylinders of not over 125 pounds water capacity (nominal). Gaskets if used between the protection cap and neck of cylinder must be renewed for each shipment. Cylinders not fitted with valve protection extension ring must be packed in wooden boxes complying with the construction, marking, and labeling requirements of § 173.25.

(2) Specification 3A1800, 3AA1800, 3AL1800, or 3E1800 (§§ 178.36, 178.37, 178.42, 178.46 of this subchapter) cylinders.

(i) Specifications 3A, 3AA and 3AL cylinders must not exceed 125 pounds water capacity (nominal). Cylinders must have valve protection or be packed in strong wooden or metal boxes as described in § 173.327(a)(2). Specification 3AL cylinders containing arsine or phosphine may only be transported by highway and rail.

(ii) Specification 3E1800 cylinders must be packed in strong wooden or metal boxes.

(3) Cyanogen chloride containing less than 0.9 percent water may also be packaged as prescribed by § 173.332(a)(2) of this subchapter.

[29 FR 18743, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.328, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

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[1] Use of existing cylinders authorized, but new construction not authorized.

§ 173.329 Bromacetone; chlorpicrin and methyl chloride mixtures; chlorpicrin and nonflammable, nonliquefied compressed gas mixtures.

(a) Bromacetone, when offered for transportation by carriers by rail freight, highway, or water, must be packed in specification containers as follows:

(1) As prescribed in § 173.328.

(2) Specification 15A, 15B, 15C, 16A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.191 of this subchapter). Wooden boxes with inside glass bottles or tubes in hermetically sealed metal cans in corrugated fiberboard cartons, Spec. 2C (§ 178.22 of this subchapter). Bottles must not contain over 1-pound of liquid each, may not be filled to over 95 percent capacity, must be tightly and securely closed, and be cushioned in cans with at least ½ inch of absorbent material. Cans must be made of metal at least 32 gauge United States standard. Total amount of liquid in outside box must not exceed 24 pounds.

(b) *Chlorpicrin and methyl chloride mixtures.* Chlorpicrin and methyl chloride mixtures, in addition to containers prescribed in § 173.328, when offered for transportation by carriers by rail freight, highway, or water, may be shipped in specification containers as follows:

(1) Specification 3A, 3AA, 3B, 3C,[1] 3E, 4A,[1] 4B, 4BA, 4BW, or 4C[1] (§§ 178.36, 178.37, 178.38, 178.42, 178.50, 178.51, 178.61, of this subchapter). Cylinders having not over 250 pounds water capacity (nominal). Valves or other closing devices must be protected to prevent damage in transit, by screw-on metal caps or by packing the cylinders in strong boxes or crates. Cylinders having a wall thickness of less than 0.10 inch must be packed in boxes or crates complying with the construction, marking, and labeling requirements of § 173.25.

(c) *Chlorpicrin and nonflammable, nonliquefied compressed gas mixtures.* Chlorpicrin and nonflammable, nonliquefied compressed gas mixtures, in addition to containers prescribed in § 173.328, when offered for transportation by carriers by rail freight, highway, or water, must be shipped in specification containers as follows:

(1) Specification 3A, 3AA, 3B, 3C,[1] 3E, 4A,[1] 4B, 4BA, 4BW, or 4C,[1] (§§ 178.36, 178.37, 178.38, 178.42, 178.50, 178.51, 178.61, of this subchapter). Cylinders having not over 250 pounds water capacity (nominal). Valves or other closing devices must be protected to prevent damage in transit, by screw-on metal caps or by packing the cylinders in strong boxes or crates. Cylinders having a wall thickness of less than 0.10 inch must be packed in boxes or crates complying with the construction, marking, and labeling requirements of § 173.25.

[29 FR 18753, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended at 45 FR 59892, Sept. 11, 1980; Amdt. 173-149, 46 FR 49903, Oct. 8, 1981]

§ 173.330 Chemical ammunition.

(a) Projectiles, shells, bombs, and grenades containing Poison A materials but not equipped or packaged with ignition elements, bursting charges, detonating fuzes, or explosive components, may be shipped only by, for, or to the Department of Defense. Each shipment must be packaged, marked, and labeled as required by their regulations. Each package must be labeled with POISON GAS label marked "NONEXPLOSIVE" and also marked with the proper shipping name. (See §§ 173.53(r) and 173.59 for explosive chemical ammunition.)

(b) Chemical ammunition containing poisonous liquids or gases, Class A, must not be offered for transportation by rail express.

[29 FR 18753, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16082, Apr. 15, 1976]

§ 173.331 Gas identification sets.

(a) Gas identification sets containing Poison A materials, irritating materials, and chlorine must be packaged in Specification 15A, 15B, 19A, or 19B (§§ 178.168, 178.169, 178.190, or 178.191 of this subchapter) wooden boxes under the following conditions:

(1) Gas identification sets containing Poison A materials and irritating materials may be shipped in amounts not

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[1] Use of existing cylinders authorized, but new construction not authorized.

exceeding 5 cubic centimeters, if a liquid, or 5 grams, if a solid, when mixed with or absorbed in activated charcoal or silica gel, or other absorbent medium, and packed in strong glass bottles of not less than 4 fluid ounces capacity. The Poison A materials and chlorine may be shipped if the gas itself is absorbed in activated charcoal or silica gel, or other absorbent medium, and packed in the same type 4-ounce bottles as described above. Each bottle as herein specified must be surrounded with appropriate absorbent cushioning material, and enclosed in a hermetically sealed metal can. Each can must be surrounded on all sides by at least 1 inch of dry, fine sawdust or wood pulp. The cans must be packed in Specification 15A, 15B, 19A, or 19B (§§ 178.168, 178.169, 178.190, 178.191 of this subchapter) wooden boxes. The bottles must be closed with ground-in glass stoppers securely fastened. The cushioning material around the bottle must be at least 1 inch thick. The cans must be made from metal of thickness not less than 30 gauge, United States standard. There must be not more than a total of 100 grams or cubic centimeters or a combination of both, in each outside wooden box.

(b) Gas identification sets containing Poison A materials and irritating materials must be packaged as follows:

(1) The liquids or liquefied gases in hermetically sealed glass tubes containing not to exceed 40 cubic centimeters each. Each tube must be securely cushioned and packed in an individual mailing tube with screw-thread metal cover. Not more than 12 such mailing tubes, cushioned with corrugated fiberboard, may be packed in a closed fiberboard container, not to exceed 4 such fiberboard containers, containing an aggregate of not to exceed 48 glass tubes cushioned and packed in an outside steel cylinder of not less than 0.145-inch wall thickness, which is closed by a plate, bolted to a flange welded to cylinder wall. Suitable gasket must be placed between flange and head plate, and closure must prevent leakage of any gas.

(c) Gas identification training sets containing Poison A materials and irritating materials must be packaged as follows:

(1) The Poison A materials and irritating material, in amounts not exceeding 5 cubic centimeters, if a liquid, or 20 grams, if a solid, when mixed with or absorbed in activated charcoal, silica gel, crepe rubber, or other absorbent medium, must be packed in strong glass bottles of not less than 2 fluid ounces capacity, equipped with a polyethylene liner; each bottle as herein specified must have a metal screw-cap closure, equipped with a built-in compression type spring and an insert in the opening of the bottle to match so that when tightened an airtight seal is obtained. Twelve bottles, containing articles as described in this paragraph and not exceeding 100 cubic centimeters or grams, or a combination of both, must be placed in a modified styrene plastic carrying case, in three rows of four bottles each and fitted with a fiberboard cell or separator. The void space around the individual bottles, and around all interior sides of the carrying case, must be filled with dry, fine sawdust or vermiculite. A sheet of sponge rubber must be fitted to the inside of the top and bottom of the carrying case to provide additional cushioning and insure a snug fit of the bottles when the top is secured. The carrying case must be fitted into a snug fitting fiberboard box, domestic type. The case must then be packed in a nailed wooden box, Specification 15A or 15B (§§ 178.168, 178.169 of this subchapter), which must be fitted with a waterproof case liner.

[Amdt. 173-94, 41 FR 16082, Apr. 15, 1976, as amended by Amdt. 173-149, 46 FR 49903, Oct. 8, 1981; Amdt. 173-158, 47 FR 43066, Sept. 30, 1982]

§ 173.332 Hydrocyanic acid, liquid (prussic acid) and hydrocyanic acid liquefied.

(a) Hydrocyanic acid, liquid (prussic acid) and hydrocyanic acid liquefied, must be packed in specification containers as follows:

(1) As prescribed in § 173.328.

(2) Specification 3A480, 3AA480, 3A480X [1] or 3AL1800 (§ 178.36, 178.37,

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[1] Use of cylinders authorized, but new construction not authorized.

178.46 of this subchapter) metal cylinders of not over 278 pounds water capacity (nominal); valve protection cap must be used and be at least $^{5}/_{16}$-inch thick, gas-tight, with $^{3}/_{16}$-inch faced seat for gasket and with United States standard form thread; the cap must be capable of preventing injury or distortion of the valve when it is subjected to an impact caused by allowing the cylinder, prepared as for shipment, to fall from an upright position with side of cap striking a solid steel object projecting not more than 6 inches above floor level. Shipments in 3AL cylinders are authorized only when transported by highway and rail.

(b) Cylinders must be charged with not more than 0.6 pound of liquid for 1-pound water capacity of cylinder. Each filled cylinder must be tested for leakage before shipment and must show absolutely no leakage; this test must consist in passing over the closure of the cylinder, without the protection cap attached, a piece of Guignard's sodium picrate paper to detect any escape of hydrocyanic acid from the cylinder. Other equally efficient test methods may also be used in lieu of the picrate paper.

(c) Liquid hydrocyanic acid completely absorbed in inert material may also be shipped in specification containers as follows:

(1) Specification 15A, or 19B (§§ 178.168, 178.191 of this subchapter). Wooden boxes with inside containers consisting of metal cans, spec. 2N (§ 178.32 of this subchapter), not over 14 pounds water capacity each. The liquid contents of each can must not exceed 0.33 pound of liquid for 1-pound water capacity of the can. Each can containing 4 ounces or more of liquid must be fitted with fiber caps not less than 0.08 inch thick flanged about 1 inch and fitting snugly over each end of the can. Each can must be tested for leakage after being filled and again after being maintained at ordinary room temperature for a period of at least three weeks. Each can must have its outer surface protected against rust by the use of enamel or lacquer, or each can must be completely wrapped in waterproof paper.

(2) The box lining must consist of not more than two pieces of waterproof paper, one piece completely surrounding the contents and running lengthwise of the box, and the other piece completely surrounding the contents and running crosswise of the box. In each instance, the wrapping must overlap at least 4 inches.

(3) Spec. 12B (§ 178.205) of this subchapter). Fiberboard boxes, constructed in accordance with requirements for a gross weight of 65 pounds but having a gross weight of not over 70 pounds, with inside containers consisting of metal cans, Spec. 2N (§ 178.32 of this subchapter). The liquid contents of each can must not exceed 0.33 pound of liquid for 1-pound water capacity of the can and the total weight of liquid in each can must not exceed 41 ounces. Each can must be tested for leakage after being filled and again after being maintained at ordinary room temperature for a period of at least three weeks. Each can must have its outer surface protected against rust by the use of enamel or lacquer. Not more than twelve cans shall be packed in the outside fiberboard box and each can shall be separated from the other by 200-pound minimum test fiberboard partitions. Each box shall be provided with 200-pound minimum test fiberboard liner and top and bottom pads of the same material. In addition to the required closure of the boxes, two metal straps measuring ½ inch by .015 inch must be applied around the girth of each box.

(d) Specification 105A500W or 105A600W (§§ 179.100 and 179.101 of this subchapter). Tank cars. Tank must be restenciled 105A300W and be equipped with safety valves of the type and size used on Spec. 105A300W (§§ 179.100 and 179.101 of this subchapter). Tank car tank must be equipped with approved dome fittings and safety devices, and with cork insulation at least 4 inches in thickness. Each tank car must be marked "HYDROCYANIC ACID" in accordance with the requirements of § 172.330 of this subchapter. Written procedures covering details of tank car appurtenances, dome fittings and safety devices, and marking, loading, handling, inspection, and testing practices shall be examined by the Bureau of Explosives and approved by the Director, OHMT before any tank car is offered for transportation of hydrocyanic acid. The maximum permitted filling density is 63 percent of the water capacity of the tank.

[29 FR 18753, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-34, 41 FR 16082, Apr. 15, 1976; Amdt. 173-138, 45 FR 32697, May 19, 1980; Amdt. 173-149, 46 FR 49903, Oct. 8, 1981; Amdt. 173-52, 46 FR 62457, Dec. 24, 1981; 47 FR 13818, Apr. 1, 1982]

§ 173.333 Phosgene or diphosgene.

(a) Phosgene or diphosgene must be packed in specification containers as follows:

(1) As prescribed in § 173.328, the filling density (see § 173.304(a)(2) Table Note 1) must not exceed 125 percent and a cylinder must not contain more than 150 pounds of phosgene.

(2) Spec. 106A500X (§§ 179.300, 179.301 of this subchapter) tanks. Authorized only for phosgene. Tanks must not be equipped with safety devices of any type. Outage must be sufficient to prevent tanks from becoming liquid full at 130 F. (55 C.) Additional requirements are prescribed for rail shipments under § 174.200 of this subchapter, and for highway shipments under § 177.834(m) of this subchapter.

(b) Each filled cylinder must be tested for leakage before shipment and must show absolutely no leakage; this test must consist in immersing the cylinder and valve, without the protection cap attached, in a bath of water at a temperature of approximately 150 F. for at least thirty minutes, during which time frequent examinations must be made to note any escape of gas. The valve of the cylinder must not be loosened after this test and before shipment.

[29 FR 18753, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-34, 35 FR 13836, Sept. 1, 1970; Amdt. 173-138, 45 FR 32697, May 19, 1980]

§ 173.334 Organic phosphates mixed with compressed gas.

(a) Hexaethyl tetraphosphate, parathion, tetraethyl dithio pyrophosphate, tetraethyl pyrophosphate, or other Poison B organic phosphate, n.o.s. (including a compound or mixture), may be mixed with a compressed gas which must be nonflammable. This mixture must not contain more than 20 percent by weight of organic phosphate and must be packaged as follows:

(1) Specification 3A240, 3AA240, 3B240, 4A240, 4B240, 4BA240, or 4BW240 (§§ 178.36, 178.37, 178.38, 178.49, 178.50, 178.51, 178.61, of this subchapter) cylinders meeting the following requirements:

(i) Each cylinder may be charged with not more than 10 pounds of the mixture, to a maximum filling density of not more than 80 percent of the water capacity;

(ii) Each cylinder must be charged in compliance with § 173.301 (e) and (f);

(iii) No cylinder may be equipped with an eduction tube or a fusible plug;

(iv) No cylinder may be equipped with any valve unless the valve is a type approved by the Department for this installation;

(v) Cylinders must be overpacked in a box so arranged to protect each valve or other closing device from damage. No more than four cylinders may be packed in a box except that in a wooden box, up to 12 cylinders may be so packed. Each box with its closing device protection must be sufficiently strong to protect all parts of each inside cylinder from deformation or breakage if the completed package were dropped six feet onto solid concrete, impacting at the weakest point.

(b) Cylinders must be packed in strong wooden boxes with valves or other closing devices protected from injury, with not more than twelve cylinders in one outside wooden box. A single-trip outside fiberboard box may be used when not more than four such cylinders are to be shipped in one outside container. Valves must be adequately protected. Box and valve protection must be of strength sufficient to protect all parts of inside containers and valves from deformation or breakage resulting from a drop of at least six feet onto a concrete floor, impacting at the weakest point.

[29 FR 18753, Dec. 29, 1964, as amended by Order 71, 31 FR 9072, July 1, 1966. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.334, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.336 Nitrogen dioxide, liquid; nitrogen peroxide, liquid; and nitrogen tetroxide, liquid.

(a) Nitrogen dioxide, liquid, nitrogen peroxide, liquid, and nitrogen tetroxide, liquid must be packed in specification containers as follows:

(1) As prescribed in § 173.328.

(2) Specification 3A480, 3AA480, 3AL1800, or 25[1] (§§ 178.36, 178.37, or 178.46 of this subchapter) metal cylinders with valve removed are authorized. Valve opening must be closed by means of a solid metal plug with tapered thread properly luted to prevent leakages; valve protection cap must be used and be at least 3/16-inch thick, gastight, with 3/16-inch faced seat for gasket and with United States standard form thread. Shipments in 3AL cylinders are authorized only when transported by highway, and rail.

(i) Each cylinder must be cleaned in compliance with the requirements of Federal Specification RR-C-901b paragraphs 3.7.2 and 3.8.2. Cleaning agents equivalent to those specified in RR-C-901b may be used; however, any cleaning agent must not be capable of reacting with oxygen. One cylinder selected at random from a group of 200 or less cleaned at the same time must be tested for oil contamination in accordance with Specification RR-C-901b paragraph 4.4.2.3 and meet the standard of cleanliness specified.

(3) Specification 106A500X or 110A500W (§§ 179.300, 179.301 of this subchapter) tanks. Each tank must be equipped with gas tight valve protection caps. Tanks must not be equipped with safety devices of any type. Outage must be sufficient to prevent tanks from becoming liquid full at 130°F. (55°C.). (See § 174.600 and 177.834(m) of this subchapter for special requirements for rail and highway shipments). Specification 110A500W tanks must be stainless steel.

(4) Specification 105A500W (§§ 179.100, 179.101 of this subchapter) tanks cars. Authorized for nitrogen tetroxide only. Tanks must be lagged with not less than a four-inch thickness of cork. All valves and fittings must be protected by a securely attached cover made of metal not subject to deterioration by the lading, and all valve openings, except the safety valve, must be fitted with screw plugs or caps to prevent leakage in the event of valve failure. Safety valve must be equipped with an approved stainless steel or platinum frangible disc. Each tank car must be marked "NITROGEN TETROXIDE" in accordance with the requirements of § 172.330 of this subchapter. Written procedures covering details of tank car appurtenances, dome fittings and safety devices, and marking, loading, handling, inspection and testing practices, must be examined by the Bureau of Explosives and approved by the Director, OHMT before any tank car is offered for transportation of nitrogen tetroxide.

[29 FR 18753, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.336, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.337 Nitric oxide.

(a) Nitric oxide must be packed in specification containers as follows:

(1) Specification 3A1800, 3AA1800, 3E1800, or 3AL1800 (§§ 178.36, 178.37, 178.42, or 178.46 of this subchapter) cylinders charged to a pressure of not more than 750 psi at 70° F. Cylinders must be equipped with a valve of stainless steel and valve seat of material which will not be deteriorated by contact with nitric oxide or nitrogen dioxide. Cylinders or valves may not be equipped with safety devices of any type. Valve outlets must be sealed by a solid threaded cap or plug and an inert gasketing material.

(i) Specification 3E1800 cylinders must be packed in strong wooden boxes of such design as to protect valves from injury or accidental functioning under conditions incident to transportation. Each outside package must be plainly marked "Inside containers comply with prescribed specifications."

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[1] Use of existing cylinders authorized, but new construction not authorized.

(ii) Specification 3A, 3AA, and 3AL cylinders must have their valves protected by metal caps or other equally protective guards securely attached to the cylinders and be of sufficient strength to protect the valves from injury during transit, or by packing in strong wooden boxes of such design as to protect valves from injury or accidental functioning under conditions incident to transportation. Each outside package must be plainly marked "Inside containers comply with prescribed specifications." Shipments in 3AL cylinders are authorized only when transported by highway and rail.

(iii) Each cylinder must be cleaned in compliance with the requirements of Federal Specification RR-C-901b paragraphs 3.7.2 and 3.8.2. Cleaning agents equivalent to those specified in RR-C-901b may be used; however, any cleaning agent must not be capable of reacting with oxygen. One cylinder selected at random from a group of 200 or less cleaned at the same time must be tested for oil contamination in accordance with Specification RR-C-901b paragraph 4.4.2.3 and meet the standard of cleanliness specified.

(2) Specification 106A500X (§§ 179.300, 179.301 of this subchapter) tank car tanks. Nitric oxide charge in each tank may not exceed 200 psig at 70° F. Each tank must be equipped with gas-tight valve protection cap (see § 179.302 of this subchapter). Each valve outlet must be sealed by a threaded solid plug or a threaded cap with inert luting or gasket material. Valves must be of stainless steel and the caps, plugs, and valve seats must be of material that will not be deteriorated by contact with nitric oxide or nitrogen dioxide. The tank may not be equipped with any safety relief device.

[29 FR 18753, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-73, 38 FR 20085, July 27, 1973; Amdt. 173-94, 41 FR 16082, Apr. 15, 1976; Amdt. 173-52, 46 FR 62458, Dec. 24, 1981; 47 FR 13818, Apr. 1, 1982]

§ 173.343 Poison B.

(a) For the purposes of Parts 170-189 of this subchapter and except as otherwise provided in this part, Class B poisons are those substances, liquid or solid (including pastes and semisolids), other than Class A poisons or Irritating materials, which are known to be so toxic to man as to afford a hazard to health during transportation; or which, in the absence of adequate data on human toxicity, are presumed to be toxic to man because they fall within any one of the following categories when tested on laboratory animals:

(1) *Oral toxicity.* Those which produce death within 48 hours in half or more than half of a group of 10 or more white laboratory rats weighing 200 to 300 grams at a single dose of 50 milligrams or less per kilogram of body weight, when administered orally.

(2) *Toxicity on inhalation.* Those which produce death within 48 hours in half or more than half of a group of 10 or more white laboratory rats weighing 200 to 300 grams, when inhaled continuously for a period of one hour or less at a concentration of 2 milligrams or less per liter of vapor, mist, or dust, provided such concentration is likely to be encountered by man when the chemical product is used in any reasonable foreseeable manner.

(3) *Toxicity by skin absorption.* Those which produce death within 48 hours in half or more than half of a group of 10 or more rabbits tested at a dosage of 200 milligrams or less per kilogram body weight, when administered by continuous contact with the bare skin for 24 hours or less.

(b) The foregoing categories shall not apply if the physical characteristics or the probable hazards to humans as shown by experience indicate that the substances will not cause serious sickness or death. Neither the display of danger or warning labels pertaining to use nor the toxicity tests set forth above shall prejudice or prohibit the exemption of any substances from the provisions of Parts 170-189 of this chapter.

[29 FR 18753, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by

Amdt. 173-94, 41 FR 16083, Apr. 15, 1976; Amdt. 173-94B, 41 FR 57070, Dec. 30, 1976]

§ 173.344 General packaging requirements for Poison B liquids.

(a) Closing and cushioning. All containers must be tightly and securely closed. Inside containers must be cushioned as prescribed, or in any case when necessary to prevent breakage or leakage.

(b) Packagings containing liquid material may not be completely filled. Outage must be as follows:

(1) For packagings of 110 gallons or less, sufficient outage must be provided so that the packaging will not be liquid full at 130° F. (55° C.).

(2) The proper vacant space (outage) in a tank car or other shipping container depends on the coefficient of expansion of the liquid and the maximum increase of temperature to which it will be subjected in transit. Outage must be calculated to the total capacity of the container.

(3) Liquid poison must not be loaded into domes of tank cars.

(4) In tank cars, outage must be calculated to percentage of the total capacity of the tank, i. e., shell and dome capacity combined. If the dome of the tank car does not provide sufficient outage, then vacant space must be left in the shell to make up the required outage.

(5) The outage for tank cars must not be less than 1 percent.

(6) No cargo tank or compartment thereof used for the transportation of any liquid poison shall be completely filled; sufficient space shall be left vacant in every case to prevent leakage from or distortion of any such cargo tank by expansion of the contents due to rise in temperature in transit, and such free space (outage) shall be sufficient in every case so that such cargo tank shall not become entirely filled with the liquid at 130° F.

[29 FR 18753, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16083, Apr. 15, 1976; Amdt. 173-94A, 41 FR 40683, Sept. 20, 1976]

§ 173.345 Limited quantities of Poison B liquids.

(a) Limited quantities of Poison B liquids for which exceptions are permitted as noted by reference to this section in § 172.101 of this subchapter or as provided in § 173.359(c), in tightly closed inside packagings, securely cushioned when necessary to prevent breakage, are excepted from the specification packaging requirements when packed according to the following paragraphs. In addition, shipments are not subject to Subpart F of Part 172 of this subchapter, to Part 174 of this subchapter except §§ 174.24 and 174.680 and to Part 177 of this subchapter except §§ 177.817 and 177.841(e).

(1) In glass packagings not over 1-quart capacity each, or in metal containers or polyethylene bottles not over 1-gallon capacity each, packed in outside steel, or wooden boxes, barrels, or drums.

(2) In glass packagings not over 1 pint capacity each, or in metal or polyethylene packagings (other than bags) not over 1 quart capacity each, packed in a strong outside fiberboard box or molded expanded polystyrene case.

(b) Special exceptions for shipment of certain drugs and medicines in the ORM-D class are prescribed in Subpart N of this part.

[Amdt. 173-94, 41 FR 16083, Apr. 15, 1976, as amended by Amdt. 173-94B, 41 FR 57070, Dec. 30, 1976; Amdt. 173-118, 43 FR 31142, July 20, 1978; Amdt. 173-149, 46 FR 49903, Oct. 8, 1981]

§ 173.346 Poison B liquids not specifically provided for.

(a) Poison B liquid, as defined in § 173.343, other than those for which special requirements are prescribed, must be packaged as follows:

(1) Spec 5, 5A, 5B, or 5C (§§ 178.80, 178.81, 178.82, or 178.83 of this subchapter). Metal barrels or drums, with openings not exceeding 2.3 inches in diameter.

(2) Spec. 17C or 17E (§ 178.115 or § 178.116 of this subchapter). Metal drums (single-trip containers), with openings not exceeding 2.3 inches in diameter.

(3) Specification 37B (§ 178.132 of this subchapter). Metal drums (single-trip containers), welded side seams, openings not over 2.3 inches in diame-

ter, capacity not over 10 gallons. Not authorized for transportation by air.

(4) Spec. 37A or 37B (§ 178.131 or § 178.132 of this subchapter). Metal drums (single-trip containers), with welded side seams, not over 5 gallons; authorized for pastes only.

(5) [Reserved]

(6) Specification 34 (§ 178.19 of this subchapter). Polyethylene drum. The shipper shall assure conformance with the requirements of § 173.24(d) of this part prior to first shipment.

(7) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes with glass or earthenware inside containers not over 1 quart capacity each, or with metal inside containers not over 1 gallon capacity each. Packages containing glass or earthenware containers must not weigh over 65 pounds gross.

(8) Spec. 12D (§ 178.207 of this subchapter). Fiberboard boxes with inside container which must be glass or earthenware not over one gallon each; authorized for not more than 75 pounds gross weight; not to contain more than 4 such inside containers if their capacity is greater than 5 pints each. Use of this container will be permitted until further order of the Department.

(9) Specification 15A, 15B, 15C, 16A, 19A or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside glass or earthenware containers not over 1-gallon capacity each, except that inside containers not over 3 gallons are authorized when only one is packed in each outside container; or with inside metal containers not over 10 gallons capacity each.

(10) Specification 103,[1] 103W, 103A[1] 103ALW, 103AW, 103BW, 104,[1] 104W, 105A100,[1] 105A100W, 109A300ALW, 111A60ALW1, 111A60F1, 111A60W1, 111A60W2, 111A100F2, 111A100W4, 112A400W, 114A400W, or 115A60W6 (§§ 179.100, 179.101, 179.200, 179.201, 179.220, 179.221 of this subchapter). Tank cars. Specification 103BW tank cars must be rubber-lined and are authorized only for arsenic acid as prescribed in § 173.348 of this subchapter.

(11) Cylinders as prescribed for any compressed gas, except acetylene, are also authorized.

(12) Specifications MC 300, MC 301, MC 302, MC 303, MC 304, MC 305, MC 306, MC 307, MC 310, MC 311, or MC 312 (§§ 178.341, 178.342, 178.343 of this subchapter). Tank motor vehicles. Tank motor vehicles designed and constructed to Specification MC 304 or MC 307 except for bottom outlets equipped with external ball valves may be used only for toluene diisocyanate.

(13) Specification 1A, 1D, or 1M (§§ 178.1, 178.4, 178.17 of this subchapter). Glass carboys in boxes or expanded polystyrene packagings. Not authorized for transportation by aircraft.

(14) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes with not more than one inside glass container of not over 1 gallon capacity, securely cushioned. Completed package, with glass container filled with water, when closed for shipment, must be capable of withstanding six four-foot drops onto solid concrete in the order bottom, four sides, and top without breakage.

(15) Spec. 21C (§ 178.224 of this subchapter). Fiber drums, with inside glass containers not over one gallon capacity each.

(16) Spec. 42B or 42D (§§ 178.107, 178.109 of this subchapter). Aluminum drums.

(17) [Reserved]

(18) Spec. 15P or 22C (§ 178.182 or § 178.198 of this subchapter). Glued plywood or wooden box, or plywood drum as prescribed by § 178.198-2(a) of this subchapter, with inside Spec. 2T (§ 178.21 of this subchapter) polyethylene container.

(19) Specification 37P (§ 178.133 of this subchapter). Steel drums, not over 5 gallons capacity, with polyethylene liner (non-reusable container). Drums exceeding 1 gallon capacity must be constructed of at least 24-gauge metal. Hole in steel drum body must be suitably plugged. Authorized only for materials that will not react with polyethylene and result in container failure. Not authorized for transportation by air.

(20) Specification 6D or 37M (§§ 178.102, 178.134 of this subchap-

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[1] The use of existing tanks authorized but new construction not authorized.

ter). Cylindrical steel overpacks with inside Specifications 2S or 2SL (§§ 178.35, 178.35a of this subchapter) polyethylene containers. Authorized for materials that will not react with polyethylene and result in container failure.

(21) Spec. 12A (§ 178.210 of this subchapter). Fiberboard boxes with not more than one inside glass bottle not over 1-gallon capacity. Shipper must have established that the completed package meets test requirements prescribed by § 178.210-10 of this subchapter.

(22) Spec. 29 (§ 178.226 of this subchapter). Mailing tubes, with polyethylene bottles not over 2 quarts capacity each.

(23) [Reserved]

(24) Specification 12P (§ 178.211 of this subchapter). Fiberboard boxes with one inside Specification 2U (§ 178.24 of this subchapter) polyethylene container of not over 5-gallon capacity or two inside Specification 2U polyethylene containers of not over 2½ gallon capacity each. Wire staples are not authorized for assembly or closure of boxes, except when polyethylene container is completely enclosed in inside boxes free of wire staples or other projections that could cause failures. Not authorized for transportation by air.

(25) Specification 16A (§ 178.185 of this subchapter). Wirebound wooden box (see § 178.185-22 of this subchapter) with inside Specification 2U (§ 178.24 of this subchapter) polyethylene container. The polyethylene container must be separated from the wooden box by a complete corrugated fiberboard liner and top and bottom pads. Not authorized for transportation by air.

(26) Spec. 12B or 12A (§ 178.205 or 178.210 of this subchapter). Fiberboard boxes with inside polyethylene bottles having a minimum wall thickness of 0.015 inch and provided with screw-cap closures, not over 1-gallon capacity each. Except for polyethylene bottles having a minimum wall thickness exceeding 0.015 inch, each bottle shall be enclosed in a box constructed of at least 200-pound test (Mullen or Cady) corrugated fiberboard and not more than four such boxes shall be packed in one outside specification shipping container. When Spec. 12A boxes are used, shipper must have established that completed package meets test requirements prescribed by § 178.210-10 of this subchapter.

(27) Specification 51 (§ 178.245 of this subchapter). Portable tank. For rail transportation see § 174.63 of this subchapter.

(28) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter), are authorized for transportation of poison B liquids, n.o.s., with no subsidiary hazard, under conditions specified in the IM Tank Table.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[29 FR 18753 Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.346, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.347 Aniline oil.

(a) Aniline oil must be packed in specification containers as follows:

(1) Specification 15A, 15B, 15C, 16A, 19A or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside metal containers not over 10 gallons capacity each, or glass bottles not over 1-pound capacity each. Not more than 25 glass bottles shall be packed in one outside box.

(2) Specification 103,[1] 103W, 103A,[1] 103AW, 104W, 105A100W, 111A60F1, 111A60W1, 111A60W2, 111A100F2, 112A200W, 112A400F, or 114A340W, (§§ 179.100, 179.101, 179.200, 179.201, of this subchapter). Tank cars.

(3) Specification MC 300, MC 301, MC 302, MC 303, MC 304, MC 305, MC 306, or MC 307 (§§ 178.340, 178.341, 178.342 of this subchapter) tank motor vehicles. Bottom outlets on Specification MC 304 cargo tanks must be equipped with valves conforming with § 178.342-5(a) of this subchapter.

(4) Spec. 5, 5A, or 5B (§§ 178.80, 178.81 or 178.82 of this subchapter). Metal barrels or drums. Net weight in

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[1] The use of existing tanks authorized but new construction not authorized.

110 gallon drums must not exceed 915 pounds.

(5) Spec. 17C (§ 178.115 of this subchapter). Metal drums (single-trip).

(6) Spec. 17E (§ 178.116 of this subchapter). Metal drums (single-trip) not over 5 gallons capacity each.

(7) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes with metal inside containers not over 1 gallon capacity each; not to contain more than 4 such inside containers if their capacity is greater than 5 pints each.

(8) Spec. 12A (§ 178.210 of this subchapter). Fiberboard boxes with inside glass bottles or metal containers not over 1 gallon capacity each. Not more than four inside containers having capacity of 1 gallon each, shall be packed in one outside container. Shipper must have established that completed package meets test requirements prescribed by § 178.210-10 of this subchapter.

(9) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter) are authorized under conditions specified in the IM Tank Table.

(b) Openings in metal barrels or drums must not exceed 2.3 inches in diameter.

(1) Gaskets not less than one-eighth inch thick must be used at bung and filling holes. Gaskets must be made of hard fiber impregnated with glycerin, metal-covered cork, impregnated asbestos sheets, or metal-covered asbestos.

(c) Filled drums must be so placed that bungs will be subjected to hydrostatic head of oil contained therein for a period of not less than 12 hours.

(1) The exterior of filled drums must be carefully examined for evidence of aniline oil, any traces of which must be removed by washing off with water or, preferably, weak acetic acid. The space between rolling hoops immediately around the bung should be painted to aid in the detection of leaks at this point.

(d) All returnable drums must bear the following notice, "PREVENT DAMAGE TO FOODSTUFFS OR OTHER FREIGHT. DRAIN THIS DRUM THOROUGHLY TIGHTEN BUNGS, WITH GASKET SECURELY IN PLACE BEFORE RETURNING. USE NEW GASKETS WHEN NECESSARY ANILINE OIL STAINS ON THE OUTSIDE OF DRUMS SHOULD BE WASHED OFF WITH WATER OR, PREFERABLY WEAK ACETIC ACID", shellacked to head of drum near the consignee's name and address.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[29 FR 18753, Dec. 29, 1964, as amended by Order 73, 32 FR 3457, Mar. 2, 1967. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.347, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.348 Arsenic acid.

(a) Arsenic acid must be packed in specification containers as follows:

(1) As prescribed in § 173.346. When shipped in metal barrels or drums, or tank motor vehicles or tank cars, without lead lining, the arsenic acid must contain not over 0.05 percent nitric acid.

(2) Specification 1A, 1D, or 1M (§§ 178.1, 178.4, 178.17 of this subchapter). Glass carboys in boxes or expanded polystyrene packagings. Not authorized for transportation by aircraft.

(3) Specification 12A or 12B (§§ 178.210, 178.205 of this subchapter). Fiberboard boxes with Specification 2E (§ 178.24a of this subchapter) inside polyethylene bottles made of high-density (Type III) polyethylene having minimum wall thickness of 0.015 inch with screw-cap closures, not over 1-gallon capacity each. Specification 12A fiberboard boxes may have not more than four inside polyethylene bottles which must be packed to provide a snug fit. Specification 12B fiberboard boxes may not contain more than one inside polyethylene bottle and not more than four such boxes may be overpacked in a strong outside fiberboard box under provisions of § 173.25.

(4) Specification 21P (§ 178.225 of this subchapter). Fiber drum overpack with inside Specification 2S, 2SL, or 2U (§§ 178.35, 178.35a, 178.24 of this subchapter) polyethylene packaging of not over 30-gallon capacity.

(5) Specification 34 (§ 178.19 of this subchapter). Polyethylene drum. The

shipper shall assure conformance with the requirements of § 173.24(d) of this part prior to first shipment.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[29 FR 18753, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.348, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.349 Carbolic acid (phenol) liquid.

(a) Carbolic acid (phenol) liquid (liquid tar acid containing over 50 percent benzo-phenol), must be packed in specification containers as follows:

(1) As prescribed in § 173.346.

(2) Specification 1A, 1D, or 1M (§§ 178.1, 178.4, 178.17 of this subchapter). Glass carboys in boxes or expanded polystyrene packagings. Not authorized for transportation by aircraft.

(3) Spec. 12A (§ 178.210 of this subchapter). Fiberboard boxes with inside glass bottles not over 5-pints capacity each. Not more than 6 inside glass bottles of 5-pints capacity each shall be packed in one outside container. Shipper must have established that the completed package meets test requirements prescribed by § 178.210-10 of this subchapter.

(4) Specification 34 (§ 178.19 of this subchapter). Polyethylene drum. The shipper shall assure conformance with the requirements of § 173.24(d) of this part prior to first shipment.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[29 FR 18753, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.349, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.350 Chemical ammunition.

(a) Chemical ammunition consisting of projectiles, shells, bombs, grenades and other containers filled with Poison B materials, without ignition elements, bursting charges, detonating fuzes, or other explosive components, must be packed for shipment in strong outside wooden or metal boxes. Boxes must be marked with proper shipping name and labeled as prescribed by this part for gases, liquids, or chemicals contained therein.

(b) Chemical ammunition, when shipped as such, must not be equipped or packed with explosive or ignition elements. (See §§ 173.53(r) and 173.59 for explosive chemical ammunition.)

[29 FR 18753, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16083, Apr. 15, 1976]

§ 173.351 Hydrocyanic acid solutions.

Hydrocyanic acid solutions not over 5 percent hydrocyanic acid must be packaged in specification containers as follows:

(a) As prescribed in § 173.332.

(b) Specification 15A, 15B, 15C, 16A, 19A or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190 or 178.191 of this subchapter) wooden boxes with inside glass bottles not over 1 pound capacity each for solutions of not over 5 percent hydrocyanic acid and not over 5 pints capacity each for solutions of not over 2 percent strength. Completed package, with glass packaging filled with water, must be capable of withstanding six four-foot drops onto solid concrete in the following order: bottom, four sides, and top, without breakage.

[Amdt. 173-52, 46 FR 62458, Dec. 24, 1981]

§ 173.352 Sodium and potassium cyanide solutions, and cyanide solution, n.o.s.

(a) Sodium and potassium cyanide solutions, and cyanide solutions, n.o.s. must be packed in specification packagings as follows:

(1) Spec. 5, 5A, or 5B (§§ 178.80, 178.81, of 178.82 of this subchapter). Metal barrels or drums without galvanizing inside, with openings not exceeding 2.3 inches in diameter.

(2) Specification 17E or 37B (§ 178.116, 178.132 of this subchapter). Metal drums (single-trip), with welded side seams, with openings not exceeding 2.3 inches in diameter. Specification 37B not authorized for transportation by air.

(3) Specification 15A, 15B, 15C, 16A, 19A or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191, of this subchapter). Wooden boxes with inside glass or earthenware containers not over 1-gallon capacity each, or

inside metal containers not over 10 gallons capacity each, and without galvanizing.

(4) Specification 103,[1] 103W, 103A[1] 103AW, 105A400W, 111A60F1, 111A60W1, 111A60W2, 111A100F2, 112A400W, or 114A400W (§§ 179.100, 179.101, 179.200, 179.201, of this subchapter). Tank cars.

(5) Specification MC-300, MC-301, MC-302, MC-303, MC-304, MC-305, MC-306, MC-307, or MC-312 (§§ 178.341, 178.342, 178.343 of this subchapter). Tank motor vehicles.

(6) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter) are authorized under conditions specified in the IM Tank Table.

(7) Specification 6D (§ 178.102 of this subchapter). Cylindrical steel overpack with inside Specification 2S or 2SL (§§ 178.35, 178.35a of this subchapter) polyethylene packaging. Not authorized for transportation by air.

(8) Specification 34 (§ 178.19 of this subchapter). Polyethylene drum. The shipper shall assure conformance with the requirements of § 173.24(d) of this part prior to first shipment.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[29 FR 18753, Dec. 29, 1964, as amended by Order 73, 32 FR 3457, Mar. 2, 1967. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.352, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.353 Methyl bromide and methyl bromide mixtures.

(a) Methyl bromide, liquid (bromomethane); methyl bromide and ethylene dibromide mixture liquid; or methyl bromide and more than 2% chloropicrin mixture, liquid; must be packed in specification containers as follows:

(1) Specification 5A (§ 178.81 of this subchapter). Metal drums not exceeding 30 gallons capacity or metal drums of bilge type not exceeding 33 gallons capacity and with openings not exceeding 2.3 inches in diameter. Not authorized for mixtures containing any compressed gas.

(2) Specification 15A, 15B, 15C, 16A, 19A, 19B or 12B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191, 178.205 of this subchapter). Wooden, wire-bound wooden, or fiberboard boxes, with inside metal cans containing not over 1-pound each, or inside metal cans with a minimum wall thickness of 0.007-inch containing not over 1¾-pound each. The 1-pound can must be able to withstand an interior pressure of 130 psig without leakage or permanent distortion and pressure of contents must not exceed 130 psig at 130°F. (55°C.). The 1¾-pound can must be able to withstand an interior pressure of 140 psig without leakage or permanent distortion and pressure of contents must not exceed 140 psig at 130°F. (55°C.). Outage shall be such that the cans will not become liquid full at 130°F. Cans must be of tinplate or lined with suitable material and must have concave or pressure ends.

(3) Specification 3A225, 3AA225, 3B225, 3E1800, 4A225[1], 4B225, 4BA225, or 4BW225, (§§ 178.36, 178.37, 178.38, 178.42, 178.49, 178.50, 178.51, 178.61 of this subchapter). Metal cylinders. Valves and other closing devices must be protected to prevent damage in transit by equipping the cylinder with valve protection required by §173.301(g). Cylinders having a wall thickness of less than 0.08-inch must be packed in boxes or crates (See § 173.25).

(4) Spec. 4D300 or 4DA500 (§ 178.53 or § 178.58 of this subchapter). Metal spheres, must be packed in strong boxes or crates (see § 173.25).

(5) Specification 105A100,[1] 105A100W, or 111A100-W-4 (§§ 179.100, 179.101, 179.200, 179.201 of this subchapter) tank cars. Outage must be sufficient to prevent tank cars from becoming liquid full at 105° F.

(6) Specification 106A500X (§§ 179.300, 179.301 of this subchapter) tanks. Outage must be sufficient to prevent tanks from becoming liquid full at 130° F. (55°C.). (See §§ 174.200 and 177.834(m) of this subchapter for special requirements for rail and highway shipments.)

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[1] The use of existing tanks authorized but new construction not authorized.

[1] Use of existing cylinders authorized, but new construction not authorized.

(7) Specification 12B (§ 178.205 of this subchapter). Fiberboard box with inside tinplated metal cans containing not more than 6 ounces net weight of product per can. Cans must be capable of withstanding a pressure of 75 pounds per square inch at 130° F without leakage or permanent distortion. Not more than 12 cans may be packed snugly in the outside fiberboard box and gross weight of completed package shall not exceed 30 pounds. Authorized only for methyl bromide and ethylene dibromide mixtures.

(8) Specification 51 (§ 178.245 of this subchapter). Steel portable tanks having a design pressure of not less than 250 pounds per square inch and equipped with a spring-load safety relief device.

(b) [Reserved]

(c) Outage must be sufficient to prevent cylinders or spheres from becoming entirely filled with liquid at 130° F. (55° C.) and when the vacant space (outage) is charged with a nonflammable nonliquefied compressed gas, the pressure in the cylinder or sphere at 130° F. (55° C.) must not exceed 5/4 the marked service pressure of the cylinder or sphere.

(d) Spec. 17C (§ 178.115 of this subchapter). Metal drums (single-trip) not over 5¼ gallons marked capacity each and having no opening exceeding 2.3 inches in diameter. Authorized only for mixtures of methyl bromide and ethylene dibromide, liquid containing not over 40 percent by weight of methyl bromide.

(e) Specifications MC 330 and MC 331 (§ 178.337 of this subchapter). Tank motor vehicle having a design pressure not less than 250 pounds per square inch equipped with an approved spring-relief safety valve. Outage must be sufficient to prevent tank from becoming entirely filled with liquid at 130° F.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[29 FR 18753, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.353, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.353a Methyl bromide, liquid, and nonflammable, nonliquefied compressed gas mixtures.

(a) Methyl bromide, liquid, and nonflammable, nonliquefied compressed gas mixtures must be packed in specification containers as noted in §173.353a (a)(2), (3), (4), (5), (6), (8) and (c).

(b) Liquid may contain 2 percent or less by weight chloropicrin.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 173-94A, 41 FR 40683, Sept. 20, 1976, as amended by Amdt. 173-171, 49 FR 2252, Jan. 19, 1984]

§ 173.354 Motor fuel antiknock compound or tetraethyl lead.

(a) Motor fuel antiknock compound (a mixture of one or more organic lead compounds such as tetraethyl lead, triethylmethyl lead, diethyldimethyl lead, ethyltrimethyl lead, and tetramethyl lead, with one or more halogen compounds such as ethylene dibromide and ethylene dichloride, hydrocarbon solvents or other equally efficient stabilizers) or tetraethyl lead must be packed in specification containers as follows:

(1) Specification 15A, or 19B (§§ 178.168, 178.191 of this subchapter). Wooden boxes with inside glass or earthenware containers of not over 1-pint capacity each, or metal cans, enclosed in hermetically sealed (soldered) strong metal cans.

(2) Spec. 5 or 5A (§ 178.80 or § 178.81 of this subchapter). Metal barrels or drums, with openings not exceeding 2.3 inches in diameter.

(3) Specification steel or nickel cylinders as prescribed for any compressed gas except acetylene.

(4) Specification 105A300-W (§§ 179.100 and 179.101 of this subchapter). *Tank car.* Each tank car must be marked "MOTOR FUEL ANTIKNOCK COMPOUND" in accordance with the requirements of § 172.330 of this subchapter. Tank car not authorized for tetraethyl lead. Openings in tank heads to facilitate application of nickel lining are authorized on tank cars constructed before January 1, 1975. These openings must

be closed in an approved (§ 179.3 of this subchapter) manner.

(5) Specification MC 330 or MC 331 (§ 178.337 of this subchapter) cargo tanks. (See Note 1). These cargo tanks are authorized for motor fuel antiknock compound only. A frangible disc may be used in series with and inboard of the pressure relief valve. The relief valve and the frangible disc must be set to function in a range of no less than 100 percent and no greater than 110 percent of the maximum allowable working pressure.

NOTE 1: Spec. MC 300, MC 301,[1] MC 302 or MC 303 (§§ 178.321, 178.323, or § 178.324 of this chapter) tank motor vehicles in motor fuel antiknock compound service prior to October 1, 1955 may be continued in service.

(6) Spec. 51 (§ 178.245 of this subchapter). Portable tanks having a minimum design pressure of 100 pounds per square inch. Authorized for motor fuel antiknock compound only. A frangible disc may be used in series with and inboard of the pressure relief valve. The relief valve and the frangible disc must be set to function in a range of no less than 100 percent and no greater than 110 percent of the maximum allowable working pressure.

(7) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes constructed on at least 375-pound test (Mullen or Cady) solid fiberboard with inside metal cans enclosed in hermetically sealed (soldered) metal cans, not over 5 pounds capacity each. Each inside metal container must be enclosed in a taped, double-faced corrugated liner constructed of at least 200-pound test (Mullen or Cady) fiberboard and fitted with die-cut end caps constructed of at least 200-pound test (Mullen or Cady) double-walled corrugated fiberboard. Authorized gross weight not over 90 pounds.

(b) Outage must be sufficient to prevent any container from becoming entirely filled with liquid at 130° F.

(c) Steel tank conforming or equivalent to ASME specifications which contain solid or semisolid residual motor fuel antiknock compound (including rust, scale, or other contaminants) may be shipped by rail freight or highway. The tank must have been designed and constructed to be capable of withstanding full vacuum. All openings must be closed with gasketed blank flanges or vapor tight threaded closures. Each tank must be secured and braced to prevent movement under conditions normally incident to transportation.

[29 FR 18753, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.354, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.355 Phenyldichlorarsine.

(a) Phenyldichlorarsine must be packed in specification containers as follows:

(1) Spec. 5A (§ 178.81 of this subchapter) Metal barrels or drums, made of not less than 12 gauge steel, and limited to 30 gallons capacity, with openings not exceeding 2.3 inches in diameter. Each metal barrel or drum must be tested before each filling to 20 pounds hydrostatic test.

[29 FR 18753, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16084, Apr. 15, 1976]

§ 173.356 Thiophosgene.

(a) Thiophosgene must be packed in specification containers as follows:

(1) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes, with inside containers which must be tightly closed glass bottles not exceeding 1 pint capacity each, securely packed in absorbent incombustible cushioning material. Cushioning material must be capable of absorbing entire contents of the container.

(2) Specification 15A, 15B, or 19B (§§ 178.168, 178.169, 178.191 of this subchapter). Wooden boxes with inside glass bottles not over 1-quart capacity each, securely packed in absorbent incombustible cushioning material in sufficient quantity to absorb any leakage.

(3) Specification 5C (§ 178.83 of this subchapter). Steel barrels or drums made of Type 304 stainless steel.

(4) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this sub-

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[1] Use of existing cargo tanks authorized, but new construction not authorized.

chapter) are authorized under conditions specified in the IM Tank Table.

[29 FR 18753, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.356, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.357 Chloropicrin and chloropicrin mixtures containing no compressed gas or Poison A liquid.

(a) *Chloropicrin.* Chloropicrin, when offered for transportation by carriers by rail freight, highway, or water, must be packed in specification containers as follows:

(1) Specification 15A, 15B, 15C, 16A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.191 of this subchapter). Wooden boxes with inside glass bottles or tubes in hermetically sealed metal cans in corrugated fiberboard cartons, Spec. 2C (§ 178.22 of this subchapter). Bottles must contain not over 1 pound of liquid each, must be filled to not over 95 percent capacity, must be tightly and securely closed, and must be cushioned in cans with at least ½ inch of absorbent material. Cans must be made of metal at least 32 gauge United States standard. Total amount of liquid in outside box must not exceed 24 pounds.

(2) Spec. 12B (§ 178.205 of this subchapter). One-piece corrugated fiberboard boxes at least 200-pound test with inside glass bottles or tubes in hermetically sealed metal cans in individual unsealed one-piece corrugated fiberboard boxes, Spec. 12B at least 200-pound test. Bottles must contain not over 1 pound of liquid each, must be filled to not over 95 percent capacity, must be tightly and securely closed, and must be cushioned in cans with at least ½ inch of absorbent material. Cans must be made of metal at least 32 gauge United States standard. Total amount of liquid in outside box must not exceed 12 pounds.

(3) Spec. 12B (§ 178.205 of this subchapter). One-piece corrugated fiberboard boxes at least 200-pound test with not more than one inside glass bottle or tube in a hermetically sealed metal can. Bottles must contain not over 1 pound of liquid, must be filled to not over 95 percent capacity, must be tightly and securely closed, and must be cushioned in cans with at least ½ inch of absorbent material. Cans must be made of metal at least 32 gauge United States standard.

(4) Specification 34 (§ 178.19 of this subchapter). Polyethylene drum. The shipper shall assure conformance with the requirements of § 173.24(d) of this part prior to first shipment.

(b) *Chloropicrin and mixtures of chloropicrin containing no compressed gas or Poison A liquid.* Chloropicrin and mixtures of chloropicrin containing no compressed gas or Poison A liquid, in addition to containers prescribed in paragraph (a) of this section, when offered for transportation by carriers by rail freight, highway, or water, may be shipped in specification containers as follows:

(1) Specification 3A, 3AA, 3B, 3C[1], 3D[1], 3E, 4A[1], 4B, 4BA, 4BW, or 4C[1] (§§ 178.36, 178.37, 178.38, 178.40, 178.41, 178.42, 178.49, 178.50, 178.51, 178.52, 178.61 of this subchapter). Metal cylinders. Valves and other closing devises must be protected to prevent damage in transit by equipping the cylinders with valve protection required by §173.301(g) of this subchapter. A cylinder closed by means of a solid plug may have the closure protected by a metal collar. Cylinders having a wall thickness of less than 0.08 inch must be packaged in boxes or crates. Each cylinder having a water capacity over 275 pounds must have a minimum design pressure of 225 p.s.i.g. unless the specification requires a higher minimum design pressure.

(2) Specification 5A or 5B (§ 178.81, 178.82 of this subchapter). Metal drums not exceeding 33-gallon capacity with welded seams. Specification 5B authorized only for chloropicrin mixtures containing not over 45 percent chloropicrin by weight. Removable head containers not authorized.

(3) Specification 17C or 17E (§§ 178.115, 178.116 of this subchapter). Metal drums (single-trip) with openings not over 2.3 inches in diameter. Capacity not to exceed 30 gallons

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[1] Use of existing cylinders authorized, but new construction not authorized.

for Specification 17E. Authorized only for mixtures of chloropicrin and technical grade dichloropropene containing not more than 15 percent chloropicrin by weight.

(4) Specification 106A500X (§§ 179.300, 179.301 of this subchapter) tanks. Valves must be protected by metal caps. Tanks must not be equipped with safety devices of any type. Outage must be sufficient to prevent tanks from becoming liquid full at 130° F. (55° C.). (See § 177.834(m) of this subchapter for special requirements for highway shipments.)

(5) Spec. 105A300-W, 105A400-W, or 105A500-W (§§ 179.100 and 179.101 of this subchapter). Tank cars.

(c) Chloropicrin and mixtures of chloropicrin containing no compressed gas or Poison A liquid, must be packaged as follows:

(1) Specification 15A, 15B, 15C, 16A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.191 of this subchapter). Wooden boxes with inside glass bottles or tubes in hermetically sealed metal cans in corrugated fiberboard cartons, Spec. 2C (§ 178.22 of this subchapter). Bottles must contain not over 1 pound of liquid each, must be filled to not over 95 percent capacity, must be tightly and securely closed, and must be cushioned in cans with at least ½ inch of absorbent material. Cans must be made of metal at least 32 gauge United States standard. Total amount of liquid in outside box must not exceed 24 pounds.

(2) Specification 15A, or 19B (§§ 178.168, 178.191 of this subchapter). Wooden boxes, metal strapped, with chloropicrin absorbed in an efficient absorbing material packed in hermetically sealed metal cans not over 1-quart capacity each.

(3) Spec. 12B (§ 178.205 of this subchapter). One-piece corrugated fiberboard boxes at least 200-pound test with inside glass bottles or tubes in hermetically sealed metal cans in individual unsealed one-piece corrugated fiberboard boxes. Spec. 12B at least 200-pound test. Bottles must contain not over 1 pound of liquid each, must be filled to not over 95 percent capacity, must be tightly and securely closed, and must be cushioned in cans with at least ½ inch of absorbent material. Cans must be made of metal at least 32 gauge United States standard. Total amount of liquid in outside box must not exceed 12 pounds.

(4) Spec. 12B (§ 178.205 of this subchapter). One-piece corrugated fiberboard boxes at least 200-pound test with not more than one inside glass bottle or tube in a hermetically sealed metal can. Bottles must contain not over 1 pound of liquid, must be filled to not over 95 percent capacity, must be tightly and securely closed, and must be cushioned in cans with at least ½ inch of absorbent material. Cans must be made of metal at least 32 gauge United States standard.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53(e), App. A to Part 1)

[29 FR 18753, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.357, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.358 Hexaethyl tetraphosphate, methyl parathion, organic phosphate compound, organic phosphorous compound, parathion, tetraethyl dithio pyrophosphate, and tetraethyl pyrophosphate, liquid.

(a) Hexaethyl tetraphosphate, methyl parathion, organic phosphate compound, organic phosphorous compound, parathion, tetraethyl dithio pyrophosphate, and tetraethyl pyrophosphate, liquid must be packed in specification containers as follows:

(1) Spec. 5, 5A, or 5B (§§ 178.80, 178.81, 178.82 of this subchapter). Metal barrels or drums, with openings not exceeding 2.3 inches in diameter.

(2) Spec. 17C or 17E (§§ 178.115, 178.116 of this subchapter). Metal drums (single-trip), with openings not exceeding 2.3 inches in diameter. Spec. 17E drums authorized for not over 5 gallons capacity each.

(3) Specification 15A, 15B, or 19B (§§ 178.168, 178.169, 178.191 of this subchapter). Wooden boxes with inside metal containers of not over 5 gallons capacity each.

(4) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes, with inside glass bottles not over 1 gallon

capacity each, securely cushioned in liquid-tight metal cans.

(5) **Specification 21C** (§ 178.224 of this subchapter). **Fiber drums, with inside glass or metal containers not over 1-gallon capacity each.**

(6) **Spec. 37A** (§ 178.131 of this subchapter). **Metal drums** (single-trip), **with inside glass containers not over 1 gallon capacity each.**

(7) **Specification cylinders as prescribed for any compressed gas except acetylene. DOT 3AL cylinders are authorized only for parathion and methyl parathion service.**

(8) **Spec. 12B** (§ 178.205 of this subchapter). **Fiberboard boxes with not more than one inside glass container of not over 1 gallon capacity, securely cushioned. Completed package, with glass container filled with water, when closed for shipment, must be capable of withstanding six four-foot drops onto solid concrete in the order bottom, four sides and top without breakage.**

(9) **Spec. 12B** (§ 178.205 of this subchapter). **Fiberboard boxes with not more than one inside container of polyethylene, or other nonfragile plastic material, and closed by a screw cap of similar material, not over 16 ounces, surrounded by absorbent cushioning and packed in a one gallon securely closed metal can which shall be surrounded with absorbent cushioning material within the outside fiberboard box.**

(10) **Spec. 42B** (§ 178.107 of this subchapter). **Aluminum drums.**

(11) **Specification 105A200ALW or 105A300W** (§§ 179.100, 179.101 of this subchapter). **Tank cars. Authorized for parathion, methyl parathion, and liquid organic phosphate compounds only. The nominal water capacity of a tank car must not exceed 12,000 gallons.**

(12) **Specification 6D** (§ 178.102 of this subchapter). **Cylindrical steel overpack with an inside Specification 2S** (§ 178.35 of this subchapter) **polyethylene container. Each full removable head overpack over 5 gallons capacity must be closed by means of a 12-gauge steel bolted ring closure with drop forged lugs, one of which is appropriately threaded. For an overpack not over 30 gallons capacity, the threaded lug must have at least a 5/8-inch bolt and locking nut, and for an overpack over 30 gallons capacity the bolt and locking nut must be at least 3/4-inch. Authorized only for materials that will not react with polyethylene and result in container failure.**

(13) **Specification 51** (§ 178.245 of this subchapter). **Portable tanks. Tanks must have no bottom opening except one 3-inch maximum plugged opening for maintenance purposes is authorized. Contents of the tank must be under no gas pressure except its own vapor pressure and the commodity must be loaded into, and unloaded from, the tank while the tank is mounted on the vehicle chassis. Authorized for parathion, methyl parathion, and organic phosphate compound only and by private motor carrier only.**

(14) **Specification MC 310, MC 311, MC 312, MC 330 or MC 331** (§§ 178.343, 178.337 of this subchapter). **Tank motor vehicle. Bottom outlets, if any, must be equipped with valves conforming with § 178.337-11(c) of this subchapter. MC 311 or MC 312 must have a minimum material thickness of 3/16-inch and designed for a product weight of 13 pounds per gallon or over. Contents of the tank must be under no gas pressure except its own vapor pressure. Authorized for parathion, methyl parathion and organic phosphate compound only, and by private motor carrier only.**

(15) **Specification 17E** (§ 178.116 of this subchapter). **Steel drum** (single-trip) **which must be made of not less than 18-gauge body and heads. Authorized only for methyl parathion, organic phosphate compound, and parathion. Shipments authorized by private motor carrier only.**

(16) **Specification IM 101 portable tanks** (§§ 178.270, 178.271 of this subchapter). **Authorized only for organic phosphate compound and organic phosphorus compound, liquid, depending on the toxicity of the material and for methyl parathion, under conditions specified in the IM Tank Table.**

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53(e), App. A to Part 1)

[29 FR 18743, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.358, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.359 Hexaethyl tetraphosphate mixtures; methyl parathion mixtures; organic phosphorus compound mixtures; organic phosphate compound mixtures; parathion mixtures; tetraethyl dithio pyrophosphate mixtures; and tetraethyl pyrophosphate mixtures, liquid (includes solutions, emulsions, or emulsifiable liquids).

(a) Hexaethyl tetraphosphate mixtures, methyl parathion mixtures, organic phosphate compound mixtures, parathion mixtures, tetraethyl dithio pyrophosphate mixtures, and tetraethyl pyrophosphate mixtures (solutions, emulsions, or emulsifiable liquids) containing not more than 50 percent hexaethyl tetraphosphate, methyl parathion, organic phosphate compound mixtures, parathion, tetraethyl dithio pyrophosphate, or tetraethyl pyrophosphate by weight, must be packed in specification containers as follows:

(1) Spec. 5, 5A, or 5B (§§ 178.80, 178.81, or 178.82 of this subchapter). Metal barrels or drums, with openings not exceeding 2.3 inches in diameter.

(2) Spec. 17C (§ 178.115 of this subchapter). Metal drums (single-trip), with openings not exceeding 2.3 inches in diameter.

(3) Spec. 17E or 37B (§ 178.116 or § 178.132 of this subchapter). Metal drums (single-trip) with openings not exceeding 2.3 inches in diameter. Capacity not to exceed 10 gallons for Spec. 17E drums. Spec. 37B drums must be constructed of at least 24-gauge metal with welded side seams, of capacity not over 5½ gallons, and must be tested as prescribed by § 178.116-12 and 178.116-13 of this subchapter. Authorized only for mixtures not classed as flammable under these regulations.

(4) Specification 15A, 15B, 15C, 15E, or 19B (§§ 178.168, 178.169, 178.170, 178.172, 178.191 of this subchapter). Wooden boxes with inside metal containers not over 10 gallons capacity each.

(5) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes, with inside glass bottles not over 1 gallon capacity each, securely cushioned in liquid-tight metal cans.

(6) Specification 21C (§ 178.224 of this subchapter). Fiber drums, with inside glass or metal containers not over 1-gallon capacity each.

(7) Spec. 37A (§ 178.131 of this subchapter). Metal drums (single-trip), with inside glass containers not over 1 gallon capacity each.

(8) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes as authorized by § 178.205-19(a) of this subchapter.

(9) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes with not more than one inside glass container of not over 1 gallon capacity, securely cushioned. Completed package, with glass container filled with water, when closed for shipment, must be capable of withstanding six four-foot drops onto solid concrete in the order bottom, four sides, and top without breakage.

(10) Spec. 42B (§ 178.107 of this subchapter). Aluminum drums.

(11) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes with inside high-density polyethylene bottles not over 1-gallon capacity each. Polyethylene bottles must have a minimum wall thickness of 0.015 inch and be equipped with screw-cap closures additionally taped for securement. Each polyethylene bottle shall be packed in an inside fiberboard box. Not more than four inside fiberboard boxes with inside polyethylene bottles shall be packed in one outside shipping container. Polyethylene used in construction of inside polyethylene bottles must be of a type compatible with the lading and shall prevent permeation of contents to a degree that would cause a hazardous condition in transportation and handling.

(12) Spec. 12A (§ 178.210 of this subchapter). Fiberboard boxes with inside securely closed metal containers not over 1-gallon capacity each. Fiberboard boxes shall be constructed of not less than 500-pound test (Mullen or Cady) double-wall corrugated fiberboard. Not more than six 1-gallon metal containers shall be packed in one outside container. Authorized gross weight not over 65 pounds.

(13) Spec. 105A300-W (§§ 179.100 and 179.101 of this subchapter). Tank cars. Authorized for organic phosphate compound mixtures, only.

(14) Specification 6D (§ 178.102 of this subchapter). Cylindrical steel overpack with an inside Specification 2S (§ 178.35 of this subchapter) polyethylene container. Each full removable head overpack over 5 gallons capacity must be closed by means of a 12-gauge steel bolted ring closure with drop forged lugs, one of which is appropriately threaded. For an overpack not over 30 gallons capacity, the threaded lug must have at least a 3/8-inch bolt and locking nut, and for an overpack over 30 gallons capacity the bolt and locking nut must be at least 5/8-inch. Authorized only for materials that will not react with polyethylene and result in container failure.

(15) Specification 51 (§ 178.245 of this subchapter). Portable tanks. Tanks must have no bottom opening except one 3-inch maximum plugged opening for maintenance purposes is authorized. Contents of the tank must be under no gas pressure except its own vapor pressure and the commodity must be loaded into, and unloaded from, the tank while the tank is mounted on the vehicle chassis. Authorized for methyl parathion mixtures, organic phosphate compound mixtures, and parathion mixtures only and by private motor carrier only.

(16) Specification MC 310, MC 311, MC 312, MC 330, or MC 331 (§§ 178.343, 178.337 of this subchapter). Tank motor vehicle. Bottom outlets, if any, must be equipped with valves conforming with § 178.337-11(*c*) of this subchapter. MC 311 or MC 312 must have a minimum material thickness of 3/16 inch and designed for a product weight of 13 pounds per gallon or over. Contents of the tank must be under no gas pressure except its own vapor pressure. Authorized for parathion mixtures, methyl parathion mixtures and organic phosphate compound mixtures only, and by private motor carrier only.

(17) Specification 37D (§ 178.137 of this subchapter). Nonreusable steel drum which must be made of not less than 21-gauge body and 20-gauge heads. Authorized only for methyl parathion mixtures, parathion mixtures, and organic phosphate compound mixtures, not exceeding a weight of 12 pounds per gallon.

(18) Specification 17E (§ 178.116 of this subchapter). Steel drum (single-trip), which must be made of not less than 18-gauge body and heads. Authorized for methyl parathion mixtures, organic phosphate compound mixtures, and parathion mixtures only, and by private motor carrier only.

(19) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter) are authorized for these materials when shipped under conditions specified for a poisonous liquid not listed by name in the IM Tank Table.

(b) Hexaethyl tetraphosphate mixtures, methyl parathion mixtures, organic phosphate compound mixtures, parathion mixtures, tetraethyl dithio pyrophosphate mixtures, and tetraethyl pyrophosphate mixtures (solutions, emulsions, or emulsifiable liquids) containing more than 50 percent hexaethyl tetraphosphate, methyl parathion, organic phosphate compound mixtures, parathion, tetraethyl dithio pyrophosphate, or tetraethyl pyrophosphate by weight, must be packed in specification containers as follows:

(1) Spec. 5, 5A, or 5B (§§ 178.80, 178.81, or 178.82 of this subchapter). Metal barrels or drums, with openings not exceeding 2.3 inches in diameter.

(2) Spec. 17C, 17E, or 37B (§ 178.115, § 178.116, or § 178.132 of this subchapter). Metal drums (single-trip) with openings not exceeding 2.7 inches in diameter. Spec. 17E drums authorized for not over 5 gallons capacity each. Spec. 37B drums must be constructed of at least 24-gauge metal with welded side seam, of not over 5½ gallons capacity, and must be tested as prescribed by §§ 178.116-12 and 178.116-13 of this subchapter.

(3) Specification 15A, 15B, or 19B (§§ 178.168, 178.169, 178.191 of this subchapter). Wooden boxes with inside metal containers of not over 5 gallons capacity each.

(4) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes, with inside glass bottles not over 1 gallon

capacity each, securely cushioned in liquid-tight metal cans.

(5) Specification 21C (§ 178.224 of this subchapter). Fiber drums, with inside glass or metal containers not over 1-gallon capacity each.

(6) Spec. 37A (§ 178.131 of this subchapter). Metal drums (single-trip), with inside glass containers not over 1 gallon capacity each.

(7) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes with not more than one inside glass container of not over 1 gallon capacity securely cushioned. Completed package, with glass container filled with water, when closed for shipment, must be capable of withstanding six four-foot drops onto solid concrete in the order bottom, four sides, and top without breakage.

(8) Spec. 42B (§ 178.107 of this subchapter). Aluminum drums.

(9) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes with not more than six inside high-density polyethylene bottles having screw-cap closures, not over 1-quart capacity each. Fiberboard boxes must have full-height corrugated fiberboard liner, top and bottom pads, and bottles must be separated by corrugated fiberboard partitions. Plastic used in construction of bottles must be of a type compatible with the lading.

(10) Specification 6D (§ 178.102 of this subchapter). Cylindrical steel overpack with an inside Specification 2S (§ 178.35 of this subchapter) polyethylene container. Each full removable head overpack over 5 gallons capacity must be closed by means of a 12-gage steel bolted ring closure with drop forged lugs, one of which is appropriately threaded. For an overpack not over 30 gallons capacity, the threaded lug must have at least a ⅜-inch bolt and locking nut, and for an overpack over 30 gallons capacity the bolt and locking nut must be at least ⅝-inch. Authorized only for materials that will not react with polyethylene and result in container failure.

(11) Specification 12B30 (§ 178.205 of this subchapter). Fiberboard boxes of not less than 275-pound test double wall corrugated with a 5-mil one piece polyethylene bag form-fitted to the inner wall. Authorized only for pressure sealed polyethylene capsules containing not over 3 milliliters each.

(12) Specification 37D (§ 178.137 of this subchapter). Nonreusable steel drum which must be made of not less than 21-gauge body and 20-gauge heads. Authorized only for methyl parathion mixtures, parathion mixtures, and organic phosphate compound mixtures, not exceeding a weight of 12 pounds per gallon.

(13) Specification 17E (§ 178.116 of this subchapter). Steel drum (single-trip), which must be made of not less than 18-gauge body and heads. Authorized for methyl parathion mixtures, organic phosphate compound mixtures, and parathion mixtures only, and by private motor carrier only.

(c) Hexaethyl tetraphosphate mixtures, methyl parathion mixtures, organic phosphorus compound mixtures, organic phosphate compound mixtures, parathion mixtures, tetraethyl dithio pyrophosphate mixtures, and tetraethyl pyrophosphate mixtures (solutions, emulsions, or emulsifiable liquids) containing not more than 25 percent hexaethyl tetraphosphate, methyl parathion, organic phosphate compound mixtures, parathion, tetraethyl dithio pyrophosphate, or tetraethyl pyrophosphate by weight, in inside metal containers not over 8 fluid ounces capacity each, packed in strong outside containers together with sufficient absorbent material to completely absorb the liquid in the event of leakage, are excepted from specification packaging requirements of this part.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53(e), App. A to Part 1)

[29 FR 18753, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.359, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.360 Perchloro-methyl-mercaptan.

(a) Perchloro-methyl-mercaptan in any quantity must not be packed with any other article. When offered for transportation by carriers by rail freight, highway, or water must be packed in specification containers as follows:

(1) [Reserved]

(2) Specification 15A, 15B, 15C, 16A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.191 of this subchapter). Wooden boxes with inside glass bottles not over 2 quarts capacity each, individually enclosed in tightly closed metal cans and cushioned therein with incombustible material. Net weight not to exceed 100 pounds in one outside box.

(3) [Reserved]

(4) Spec. 5K or 5M (§ 178.88 or § 178.90 of this subchapter). Nickel or monel barrels or drums.

(5) Specification 51 (§ 178.245 of this subchapter). Portable tanks, monel-clad. Tanks with bottom discharge outlets are prohibited. For rail transportation see § 174.63 of this subchapter.

(6) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter) are authorized under conditions specified in the IM Tank Table.

[29 FR 18753, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

Editorial Note: For Federal Register citations affecting § 173.360, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.361 Aldrin mixtures, liquid, with more than 60 percent aldrin.

(a) Aldrin mixtures, liquid, with more than 60 percent aldrin must be shipped in specification containers as follows:

(1) As prescribed in § 173.346.

(2) Specification 6B or 6C (§§ 178.98, 178.99 of this subchapter). Metal barrels or drums. Authorized only for viscous mixtures or those which may become partially solid.

(3) Spec. 17C or 17H (§ 178.115 or § 178.118 of this subchapter). Metal drums (single-trip). Drums with opening exceeding 2.3 inches in diameter authorized only for viscous mixtures or those which may become partially solid.

(4) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter) are authorized under conditions specified in the IM Tank Table.

[29 FR 18753, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

Editorial Note: For Federal Register citations affecting § 173.361, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.362 4-Chloro-o-toluidine hydrochloride.

(a) 4-Chloro-o-toluidine hydrochloride must be shipped in specification containers as follows:

(1) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes with glass polyethylene, or equally efficient inside containers not over 1 quart capacity each, securely packed in a tightly closed metal container.

(2) Specification 15A, 15B, or 19B (§§ 178.168, 178.169, 178.191 of this subchapter). Wooden boxes with inside glass, polyethylene, or equally efficient containers not over 1-quart capacity each. Glass containers must be securely packed in tightly closed metal containers.

(3) Spec. 17C or 17H (§ 178.115 or § 178.118 of this subchapter). Metal drums (single-trip).

(4) Spec. 6B or 6C (§ 178.98 or § 178.99 of this subchapter). Metal barrels or drums.

(5) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter) are authorized under conditions specified in the IM Tank Table.

[29 FR 18753, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

Editorial Note: For Federal Register citations affecting § 173.362, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.362a Dinitrophenol solutions.

(a) Dinitrophenol solutions must be packed in specification containers as follows:

(1) In containers prescribed in § 173.346.

(2) Spec. 12B (§ 178.205 of this subchapter). Fiberboard box with glass, earthenware, or metal inside containers not over 1 gallon capacity each; not to contain more than 4 inside glass or earthenware containers if their capacity is greater than 5 pints each.

(3) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter) are authorized under conditions specified in the IM Tank Table.

[29 FR 18753, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

Editorial Note: For Federal Register citations affecting § 173.362a, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.363 General packaging requirements for Poison B solids.

(a) Closing and cushioning. All containers must be tightly and securely closed. Inside containers must be cushioned as prescribed, or in any case when necessary to prevent breakage or leakage.

(b) Testing inside containers. All inside containers, except those made of glass, must be able to pass a test by dropping, after filling, from a height of 4 feet to solid concrete without rupture or sifting of contents, except that for bags with contents weighing 25 pounds, a drop test of 2 feet is required.

[29 FR 18753, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16084, Apr. 15, 1976]

§ 173.364 Limited quantities of Poison B solids.

(a) Unless otherwise excluded by paragraph (a)(3) of this section, Limited Quantities of Poison B solids for which exceptions are permitted, as noted by reference to this section in § 172.101 of this subchapter, are excepted from specification packaging requirements of this part if in tightly closed inside packaging securely cushioned when necessary to prevent breakage according to the following paragraphs. (In addition, these shipments are not subject to Subpart F of Part 172 of this subchapter, to Part 174 of this subchapter except § 174.24 and § 174.680, or to Part 177 of this subchapter except § 177.817 and § 177.841(e).)

(1) In inside glass, earthenware, or composition bottles or jars, or metal packaging, or lock-corner sliding-lid wooden boxes, not over 5 pounds capacity each, or inside chipboard, pasteboard, or fiber cartons, cans, boxes, or tightly closed strong plastic bags or bottles compatible with product, not over 1 pound capacity each, packed in an outside wooden or fiberboard box, or wooden barrel or keg, or molded expanded polystyrene case. Net weight of contents of each outside container may not exceed 100 pounds.

(2) In inside plastic bottles or jars, chipboard, pasteboard or fiber cartons, cans, or boxes, of not over 5 pounds capacity each, packed in outside fiberboard or wooden boxes. Not more than 6 of these cartons shall be packed in any outside container.

(3) The following materials are excluded from this exception: Cyanides (other than as specified in § 173.370 (b) and (d)), hexaethyl tetraphosphate mixtures, methyl parathion mixtures, organic phosphorus compound mixtures, and organic phosphate mixtures.

(b) Special exceptions for shipment of certain drugs and medicines in the ORM-D class are prescribed in Subpart N of this part.

[Amdt. 173-94, 41 FR 16084, Apr. 15, 1976]

Editorial Note: For Federal Register citations affecting § 173.364, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.365 Poison B solids not specifically provided for.

(a) Poison B solids, as defined in § 173.343, other than those for which special requirements are prescribed, must be packaged as follows:

(1) Specification 5, 5A, 5B, 6B, or 6C (§§ 178.80, 178.81, 178.82, 178.98, 178.99 of this subchapter). Metal barrels or drums.

(2) Specification 17E, 17H, 37A, or 37B (§§ 178.116, 178.118, 178.131, 178.132 of this subchapter). Metal drums (single-trip). Gross weight may not exceed 460 pounds. Regardless of the gross weight marking embossed on the drum, a drum constructed of 22-gauge steel is authorized for material fused solid in the drum with a gross weight not to exceed 880 pounds and for waste material containing arsenic trioxide with a gross weight not to exceed 550 pounds.

(3) Specification 44D (§ 178.238 of this subchapter). Multiwall paper bags. Where extensible Kraft is used, the minimum total basis weight must be 260 pounds and the outer wall may be no less than 60 pounds basis weight. Bag must have a metal foil inner liner.

Net weight not over 50 pounds each. For transportation by vessel, bags must be unitized or containerized. Not authorized for transportation by aircraft. Authorized only for carbamate pesticide mixtures containing not more than 15 percent active ingredient.

(4) [Reserved]

(5) Specification 12B (§ 178.205 of this subchapter). Fiberboard boxes, with inside wide-mouth, high-density polyethylene jars of 2½-pound capacity with a minimum wall thickness of 0.020 inch, or of 3-pound capacity with a minimum wall thickness of 0.035 inch. Each jar must have a screw-cap closure and not more than six jars are authorized per box. Completed package must meet test requirements of § 178.210-10 of this subchapter.

(6) Spec. 12B or 12C (§ 178.205 or § 178.206 of this subchapter). Fiberboard boxes, with inside containers which must be metal cans not over 25 pounds capacity each; glass bottles not over 1 gallon capacity each; fiber cans or boxes, Spec. 2G (§ 178.26 of this subchapter); sliding-top wooden boxes, lined to prevent sifting, not over 25 pounds capacity each; or paper bags, Spec. 2D (§ 178.23 of this subchapter). Packages containing glass or earthenware containers must not weigh over 65 pounds gross nor contain more than 4 inside containers of over 5 pints capacity each. Outside containers must be not over 5,000 cubic inches capacity nor contain over 50 pounds net weight each, except as provided in § 178.205-23 of this subchapter.

TEST: The completed package prepared as for shipping must be capable of standing a drop of 4 feet to solid concrete without breakage of the container or any sifting of contents.

(7) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes with securely closed inside fiberboard or chipboard boxes not over 6 pounds net weight each. Interior containers must be at least .028 inch thick for those not over 2½ pounds net weight each and at least .034 inch thick for others. Outside packages must contain not over 36 pounds net weight of material each.

TEST: The individual interior containers as well as the completed package prepared as for shipping must be capable of standing a drop of 4 feet to solid concrete without breakage of the container or any sifting of contents.

(8) Specification 15A or 19B (§§ 178.168, 178.191 of this subchapter). Wooden boxes with inside paper bags, securely closed and packed within a waterproof duplex bag, Spec. 2J (§ 178.28 of this subchapter). Net weight not to exceed 100 pounds in one outside box.

(9) Specification 15A, 15B, 15C, 16A, 19A or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside metal cans not over 25 pounds capacity each; glass or earthenware containers not over 1-gallon capacity each; except that inside containers of not over 5 gallons capacity each and containing not over 25 pounds net weight are authorized when only one inside container is packed in each outside box. Fiber cans or boxes, Spec. 2G (§ 178.26 of this subchapter), or sliding-top wooden boxes, lined to prevent sifting, not over 25 pounds capacity each. Net weight not to exceed 100 pounds in one outside box.

(10) Spec. 18B (§ 178.193 of this subchapter). Wooden kits lined as prescribed by Spec. 2K (§ 178.29 of this subchapter). Net weight not over 30 pounds each.

(11) Specification 56 (§ 178.252 of this subchapter). Metal portable tank. Authorized only for *p-nitrobenzyl bromide*.

(12) Spec. 22A (§ 178.196 of this subchapter). Plywood drums. Net weight not over 115 pounds each.

(13) Specification 103,[1] 103W, 103A,[1] 103AW, 111A60F1, 111A60W1, 111A60W2, or 111A100F2 (§§ 179.200, 179.201 of this subchapter). Tank cars.

(14) Specification 21C (§ 178.224 of this subchapter). Fiber drums. Maximum net weight may not exceed 225 pounds except that a 21C400 fiber drum may have a net weight not exceeding 350 pounds.

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[1] The use of existing tanks authorized but new construction not authorized.

(15) Specification 12B (§ 178.205 of this subchapter). Fiberboard boxes constructed of at least 275-pound test double-faced fiberboard and provided with a perimeter liner and bottom pad of at least 200-pound test fiberboard. Boxes constructed of at least 350-pound fiberboard having top and bottom pads need not have a perimeter liner. Product must be contained within a tightly closed polyethylene or other equally efficient plastic bag constructed of material having a minimum thickness of 0.004-inch. Not more than 25 pounds net weight of product may be packed in one outside box. Not authorized for transportation by air.

(16) Spec. 12A (§ 178.210 of this subchapter). Fiberboard boxes with inside glass bottles not over 5 pounds capacity each. Not more than 4 inside glass bottles of 5 pounds capacity each shall be packed in one outside container. Shipper must have established that the completed package meets test requirements prescribed by § 178.210-10 of this subchapter.

(17) Spec. 37P (§ 178.133 of this subchapter). Steel drums with polyethylene liner (nonreusable container), not over 15-gallons capacity.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[29 FR 18753, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

Editorial Note: For Federal Register citations affecting § 173.365, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.366 Arsenic (arsenic trioxide) or arsenic acid (solid).

(a) Arsenic (arsenic trioxide) or arsenic acid (solid) must be packed in specification containers as follows:

(1) As prescribed in § 173.365.

(2) [Reserved]

(3) In addition to specification containers prescribed in this section, arsenic (arsenic trioxide) or arsenic acid (solid) may be shipped when packed in collapsible, rubber containers, not over 70 cubic feet capacity, of a type examined by the Bureau of Explosives and approved by the Director, OHMT. Authorized for carload, truckload or freight container shipments only.

(b) Import shipments of arsenic (arsenic trioxide) may also be shipped when packed as follows:

(1) Enclosed in strong waterproofed cloth containers, securely sewn and closed so as to provide a sift-proof package, and then packed in strong, tight, metal-strapped wooden boxes constructed of material not less than three-fourths inch thick throughout.

(2) In strong and tight metal drums inclosed in a strong outside wooden barrel.

(3) In tight metal drums of not over 25-gallon capacity and a maximum gross weight of 460 pounds. Drums must be constructed of at least 22-gauge steel.

[29 FR 18753, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-81, 39 FR 17320, May 15, 1974; Amdt. 173-102, 41 FR 55878, Dec. 23, 1976; Amdt. 173-138, 45 FR 32698, May 19, 1980]

§ 173.367 Arsenical compounds, n.o.s.; arsenate of lead; calcium arsenate; Paris green; and arsenical mixtures.

(a) Arsenical compounds n.o.s., arsenate of lead, calcium arsenate, Paris green, and arsenical mixtures must be packed in specification containers as follows:

(1) As prescribed in § 173.365.

(2) Specification 36A or 36B (§§ 178.230, 178.233 of this subchapter). Triplex bags. Authorized only for arsenical insecticides and fungicides containing 10 percent or less of arsenic trioxide. Not authorized for transportation by air.

(3) Specification 44B (§ 178.236 of this subchapter). Multiwall paper bags with inside paper bags, Specification 2D (§ 178.23 of this subchapter). Net weight not over 50 pounds each. Not authorized for transportation by air.

(4) Specification 44C (§ 178.237 of this subchapter). Multiwall paper bags. For carload and truckload shipments only. Net weight not over 50 pounds each.

(5) Specification 44D (§ 178.238 of this subchapter). Multiwall paper bags. Where extensible Kraft is used the minimum total basis weight must be 260 pounds and the outer wall may be no less than 60 pounds basis weight. Net weight not over 50 pounds each.

Not authorized for transportation by air.

(6) Specification 44E (§ 178.239 of this subchapter). Multiwall paper bags constructed with minimum total basis weight of 160 pounds. For carload or truckload shipments only by rail or highway transportation; loaded by the consignor and unloaded by the consignee or his duly authorized agent. Net weight not over 50 pounds each. Where extensible Kraft is used, the minimum total basis weight for 40-pound net weight bags must be 190 pounds and for 20-pound net weight bags it must be 150 pounds. Not authorized for transportation by air or water.

(b) Arsenical compounds n.o.s. containing not more than 6 percent arsenic of which not more than 0.5 percent is water soluble must be packed in specification containers as follows:

(1) As prescribed in paragraph (a) (1), (2), or (3) of this section.

(2) Specification 44B (§ 178.236 of this subchapter). Paper bags with two added inside thicknesses of No. 1 Kraft paper one sheet having a Mullen test of 50 and the other sheet having a Mullen test of 40. Net weight not over 50 pounds each. Not authorized for transportation by air.

[29 FR 18753, Dec. 29, 1964, as amended by Order 66, 30 FR 5747, Apr. 23, 1965. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-81, 39 FR 17320, May 15, 1974; Amdt. 173-94, 41 FR 16085, Apr. 15, 1976]

§ 173.368 Arsenical dust, arsenical flue dust, and other poisonous noncombustible by-product dusts; also arsenic trioxide, calcium arsenate, and sodium arsenate.

(a) Arsenic dust, arsenical flue dust, and other poisonous noncombustible by-product dusts from metal recovery operations not subject to dangerous spontaneous heating, and arsenic trioxide, calcium arsenate, or sodium arsenate, when delivery is made to plants with private sidings only, may, in addition to packagings prescribed in § 173.367, be shipped in bulk in the following kinds of transport vehicles, if those transport vehicles are assigned exclusively to this type of service;

(1) Sift-proof; self-clearing, hopper or bottom outlet steel cars.

(2) Sift-proof, all steel flat bottom gondola cars with fixed sides and ends equipped with waterproof and dust-proof wooden or steel covers well secured in place for all openings.

(3) Sift-proof box cars of all steel construction, or "Sift-proof, self-clearing, hopper-type or dump-type motor vehicles having bodies with waterproof and dust-proof covers well secured in place."

(b) Transport vehicles assigned exclusively to this service must be marked "ARSENICAL SERVICE ONLY," in addition to other required markings, and are not subject to § 174.615 or § 177.841 of this subchapter while in that service.

[Amdt. 173-94, 41 FR 16085, Apr. 15, 1976, as amended by Amdt. 173-94A, 41 FR 40684, Sept. 20, 1976]

§ 173.369 Carbolic acid (phenol), not liquid.

(a) Carbolic acid (phenol), not liquid must be packed in specification containers as follows:

(1) Spec. 5, 5A, 5B, 5C, 6B, or 6C (§§ 178.80, 178.81, 178.82, 178.83, 178.98, or 178.99 of this subchapter). Metal barrels or drums.

(2)–(3) [Reserved]

(4) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes with inside containers which must be metal cans not over 25 pounds capacity each.

(5) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes with glass or earthenware inside containers not over 1 quart capacity each, or with metal inside containers not over 1 gallon capacity each. Packages containing glass or earthenware containers must not weigh over 65 pounds gross; packages containing metal cans not over 84 pounds gross as provided in § 178.205-23 of this subchapter, 65 pounds for others.

(6) Spec. 12D (§ 178.207 of this subchapter). Fiberboard boxes with inside containers which must be: Glass or earthenware not over 1 gallon or 5 pounds capacity each; authorized for not more than 75 pounds gross weight; not to contain more than 4 such inside

containers if their capacity is greater than 5 pints each.

(7) Specification 15A, 15B, 15C, 16A, 19A or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.190, 178.191 of this subchapter). Wooden boxes with inside glass or earthenware containers not over 1-gallon or 5 pounds capacity each, except that inside containers not over 3 gallons or 15 pounds capacity each are authorized when only 1 is packed in each outside box; or with inside metal containers not over 10 gallons capacity each.

(8) Specification 15A, 15B, 15C, or 19B (§§ 178.168, 178.169, 178.170, 178.191 of this subchapter). Wooden boxes with inside metal containers, Spec. 2F (§ 178.25 of this subchapter). Net weight not to exceed 250 pounds in one outside box.

(9) Spec. 17E or 17H (§ 178.116 or § 178.118 of this subchapter). Metal drums (single-trip).

(10) [Reserved]

(11) Specification 37A or 37B (§§ 178.131, 178.132 of this subchapter). Metal drums (single-trip). Not authorized for transportation by air.

(12) Specification 42B (§ 178.107 of this subchapter). Aluminum drums.

(13) Specification 103,[1] 103W, 103-ALW, 103A,[1] 103AW, 103A-ALW, 111A60-ALW1, 111A60F1, 111A60W1, 111A60W2, 111A100F2, or 115A60W6 (§§ 179.200, 179.201, 179.220, 179.221 of this subchapter). Tank cars.

(i) Tank cars must not be entirely filled. Sufficient interior space must be left vacant to prevent leakage from or distortion due to the contents liquefying and expanding from increase of temperature during transit.

(ii) Solid phenol must not be loaded into domes of tank cars.

(iii) In tank cars, outage must be calculated to percentage of the total capacity of the tank, i.e., shell and dome capacity combined. If the dome of the tank car does not provide sufficient outage, then vacant space must be left in the shell to make up the required outage.

(iv) The outage for tank cars must not be less than one percent.

(14) Specifications MC 300, MC 301, MC 302, MC 303, MC 305, MC 306, MC 307, MC 310, MC 311, or MC 312 (§§ 178.341, 178.342, 178.343 of this subchapter). Tank motor vehicles.

(i) No cargo tank or compartment thereof shall be completely filled; sufficient space shall be left vacant in every case to prevent leakage from or distortion of any such cargo tank by expansion of the contents due to rise in temperature in transit, and such free space (outage) shall be sufficient in every case so that such cargo tank shall not become entirely filled with the commodity at 130° F.

(15) Spec. 12A (§ 178.210 of this subchapter). Fiberboard boxes with inside glass, polyethylene, or other nonfragile plastic bottles not over 5 pounds capacity each. Not more than 4 inside glass bottles of 5 pounds capacity each shall be packed in one outside container. Shipper must have established that the completed package meets test requirements prescribed by § 178.210-10 of this subchapter.

(16) Spec. 21C (§ 178.224 of this subchapter). Fiber drums with not more than one inside metal container, Spec. 2A (§ 178.20 of this subchapter), having maximum net weight of 50 pounds.

(b) Carbolic acid (phenol), not liquid, in tightly closed inside packagings, securely cushioned when necessary to prevent breakage and packaged as follows, is excepted from the specification packaging requirements of this part.

(1) In inside glass, earthenware, polyethylene or other nonfragile plastic bottles or jars not over 1 pound capacity each, or metal containers not over 5 pounds capacity each, packed in outside wooden boxes, barrels or kegs, or fiberboard boxes. Net weight of contents in fiberboard boxes shall not exceed 65 pounds; and not more than 100 pounds in wooden boxes, barrels or kegs.

[29 FR 18753, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

Editorial Note: For Federal Register citations affecting § 173.369, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

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[1] The use of existing tanks authorized but new construction not authorized.

§ 173.370 Cyanides and cyanide mixtures, dry.

(a) Cyanides and cyanide mixtures, dry, except cyanide of calcium and mixtures thereof, unless otherwise provided for in this section, if containing the cyanide equivalent of 10 percent or more of potassium cyanide, must be packaged as follows:

(1) Specification 15A, 15B, 15C, or 19B (§§ 178.168, 178.169, 178.170, 178.191 of this subchapter). Wooden boxes with inside metal containers, Spec. 2F (§ 178.25 of this subchapter), not over 25 pounds capacity each; or hermetically sealed (soldered) metal lining, Spec. 2F (§ 178.25 of this subchapter), or in glass bottles not over 5 pounds capacity each.

(2) Specification 12B40 (§ 178.205 of this subchapter). Fiberboard box with inside polyethylene bottles having a minimum thickness of 0.030-inch and not over 5-pound capacity each. Maximum net weight of contents must not exceed 25 pounds per box.

(3) Spec. 12B or 12C (§ 178.205 or § 178.206 of this subchapter). Fiberboard boxes with metal inside containers, Spec. 2F (§ 178.25 of this subchapter) not over 25 pounds capacity each.

(4) Spec. 5, 5A, 5B, 6B, or 6C (§§ 178.80, 178.81, 178.82, 178.98, 178.99 of this subchapter). Metal barrels or drums.

(5) Spec. 37A or 37B (§ 178.131 or § 178.132 of this subchapter), metal drums (single-trip containers).

(6) Bulk in watertight metal cars or in watertight container car metal containers.

(7) Spec. 17H (§ 178.118 of this subchapter) metal drums. Gross weight not over 450 pounds.

(8) Specification 45B (§ 178.240 of this subchapter). Bags, cloth, and paper, lined. Authorized only for sodium cyanides of globular or pellet form, diameter not less than ¾-inch. Net weight not over 100 pounds. Not authorized for transportation by air.

(9) Bulk in watertight metal-bodied covered motor vehicles.

(10) [Reserved]

(11) Spec. 21C (§ 178.224 of this subchapter). Fiber drums. Authorized net weight not over 225 pounds.

(12) Specification 12B (§ 178.205 of this subchapter). Fiberboard boxes constructed of at least 275-pound test double-faced fiberboard and provided with a perimeter liner and bottom pad of at least 200-pound test fiberboard. Boxes constructed of at least 350-pound fiberboard having top and bottom pads may not require perimeter liner. Products must be contained within a tightly closed polyethylene or other equally efficient plastic container constructed of material having minimum thickness of 0.004-inch. Not more than 25 pounds net weight of product may be packed in one outside box. Not authorized for transportation by air.

(13) Bulk in strong, water-tight, metal portable containers of not over 70 cubic feet capacity each and approved by the Director, OHMT.

(b) *Exceptions for cyanides, and cyanide mixtures, except cyanide of calcium and mixtures thereof.* Cyanides and cyanide mixtures, except cyanide of calcium and mixtures thereof, when described and packaged as follows, are excepted from the specification packaging requirements of this part:

(1) Cyanides, or cyanide mixtures, in tightly closed glass, earthenware, metal, or polyethylene inside containers, not over 1 pound each, securely cushioned and packed in outside wooden or fiberboard boxes, or in wooden barrels. Net weight of cyanides or cyanide mixtures in any outside container, not over 25 pounds.

(2) Cyanide mixtures in tightly closed glass, earthenware, or metal inside containers, securely cushioned and packed in outside wooden or fiberboard boxes, or in wooden barrels. Net weight of cyanide mixtures in any outside container not over 5 pounds.

(3) Cyanides of copper, zinc, lead, and silver are excepted from all packaging requirements except §§ 173.24 and 173.363.

(c) *Cyanide of calcium and mixtures thereof.* Cyanide of calcium and mixtures thereof must be packed in specification containers as follows:

(1) As prescribed in paragraph (a) (2), (3), (4), (6), (9), or (11) of this section.

(2) Specification 15A, 15B, 15C, or 19B (§§ 178.168, 178.169, 178.170, 178.191 of this subchapter). Wooden boxes with inside metal containers,

Spec. 2F (§ 178.25 of this subchapter), not over 25 pounds capacity each; or hermetically sealed (soldered) metal lining, Spec. 2F (§ 178.25 of this subchapter).

(3) Spec. 37A or 37B (§ 178.131 or § 178.132 of this subchapter), metal drums (single-trip containers); welded side seams required for Spec. 37B drums and all seams and closures must be watertight and hermetically sealed.

(d) *Exceptions for cyanide of calcium and mixtures thereof.* Cyanide of calcium and mixtures thereof, when described and packaged as follows, are excepted from the specification packaging requirements of this part.

(1) Cyanide of calcium and mixtures thereof in tightly closed metal inside containers having not over 1 pound net weight each, or metal cans having not over 5 pounds net weight each. Not more than 25-1-pound containers or more than 1-5-pound container securely cushioned may be packed in the outside container which must be wooden or fiberboard boxes, or wooden barrels.

[29 FR 18753, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.370, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.371 Dinitrobenzol (dinitrobenzene).

(a) Dinitrobenzol must be packaged as follows:

(1) As prescribed in § 173.346 or § 173.365 according to its physical form at 130° F. (55° C.).

[Amdt. 173-94, 41 FR 16085, Apr. 15, 1976]

§ 173.372 Mercury bichloride (mercuric chloride).

(a) Mercury bichloride (mercuric chloride) must be packed in specification containers as follows:

(1) As prescribed in § 173.365.

(2) Specification 15A or 19B (§§ 178.168, 178.191 of this subchapter). Wooden boxes with inside strong paper bags in tightly closed inside wooden boxes.

[29 FR 18753, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16085, Apr. 15, 1976; Amdt. 173-149, 46 FR 49905, Oct. 8, 1981]

§ 173.373 Ortho-nitroaniline and paranitroaniline.

(a) Ortho-nitroaniline and paranitroaniline must be packed in specification containers as follows:

(1) As prescribed in § 173.365.

(2) [Reserved]

(3) Spec. 21C (§ 178.224 of this subchapter). Fiber drums. Authorized net weight not over 400 pounds.

(4) In addition to specification containers prescribed in this section, paranitroaniline may be shipped by highway in bulk in strong, water-tight, metal bodied covered hopper motor vehicles.

(5) Specification 56 (§ 178.252 of this subchapter). Metal portable tank. Authorized for paranitroaniline only. For rail transportation see § 174.63 of this subchapter.

(6) Specification MC 304, MC 307, MC 310, MC 311, or MC 312 (§§ 178.340, 178.342, 178.343 of this subchapter). Tank motor vehicles. If the cargo tank is constructed with bottom outlets, they must meet §§ 178.342-5(a) and 178.343-5 of this subchapter. Cargo tank must be insulated and have a steel inner tank. Authorized only for ortho-nitroaniline loaded in a liquefied state at a temperature not over 180° F. Not authorized for transportation by water.

[29 FR 18753, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16086, Apr. 15, 1976; Amdt. 173-101, 41 FR 50264, Nov. 15, 1976; Amdt. 173-114, 43 FR 8522, Mar. 2, 1978]

§ 173.374 Nitrochlorobenzene, meta or para.

(a) Nitrochlorobenzene, meta or para, must be packed in specification containers as follows:

(1) As prescribed in § 173.365.

(2) Specification 21C (§ 178.224 of this subchapter). Fiber drums. Authorized only for nitrochlorobenzene, para, flaked. Net weight not to exceed 400 pounds.

(3) Spec. 17E (§ 178.116 of this subchapter). Metal drums (single-trip).

(4) Specification MC-312 (§ 178.343 of this subchapter). Insulated cargo tank equipped with heating coils. Authorized only for nitrochlorobenzene,

para, solid. Not authorized for transportation by water.

(5) Specification 105A400W, 112A400W or 114A400W (§§ 179.100, 179.101 of this subchapter). Tank cars.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[29 FR 18753, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16086, Apr. 15, 1976; Amdt. 173-159, 47 FR 54827, Dec. 6, 1982; Amdt. 173-171, 49 FR 2253, Jan. 19, 1984]

§ 173.375 Sodium azide.

(a) Sodium azide must be packed in specification containers as follows:

(1) Specification 15A or 19B (§§ 178.168, 178.191 of this subchapter). Wooden boxes with inside paper bags, securely closed and packed within a waterproof duplex bag, Spec. 2J (§ 178.28 of this subchapter). Net weight not to exceed 100 pounds in one outside box.

(2) Specification 21C (§ 178.224 of this subchapter). Fiber drums with inside polyethylene moisture barrier. Maximum net weight may not exceed 115 pounds.

(3) Specification 56 (§ 178.252 of this subchapter). Stainless steel portable tank designed for top loading and unloading only. Tanks may be equipped with a bottom clean out plug. No part of the tank or fittings that come in contact with the sodium azide may contain any metal such as copper, lead, silver or mercury which can form explosive azide compounds. Each transport vehicle must be loaded by the consignor and unloaded by the consignee or by persons trained by the consignor. Not authorized for transportation by water.

[29 FR 18753, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-94, 41 FR 16086, Apr. 15, 1976; Amdt. 173-111, 42 FR 58938, Nov. 14, 1977; Amdt. 173-149, 46 FR 49905, Oct. 8, 1981; Amdt. 173-151, 46 FR 58696, Dec. 3, 1981]

§ 173.376 Aldrin and aldrin mixtures, dry, with more than 65 percent aldrin.

(a) Aldrin and aldrin mixtures, dry, with more than 65 percent aldrin, must be packed in specification containers as follows:

(1) As prescribed in § 173.365.

[29 FR 18753, Dec. 29, 1964, as amended by Order 67, 30 FR 7423, June 6, 1965. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.376, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.377 Hexaethyl tetraphosphate mixtures; methyl parathion mixtures; organic phosphorus compound mixtures, organic phosphate compound mixtures; parathion mixtures; tetraethyl dithio pyrophosphate mixtures; and tetraethyl pyrophosphate mixtures, dry.

(a) Hexaethyl tetraphosphate mixtures, methyl parathion mixtures, organic phosphorus compound mixtures, organic phosphate compound mixtures, parathion mixtures, tetraethyl dithio pyrophosphate mixtures, and tetraethyl pyrophosphate mixtures in which the liquid is absorbed in concentrations greater than 2 percent but not exceeding 27 percent in an inert dry material so as to form a dry mixture, must be packed in specification containers as follows:

(1) Specification 12B or 12C (§§ 178.205, 178.206 of this subchapter), fiberboard boxes, with inside containers which must be metal or fiber cans not over 12 pounds capacity each, or paper bags, Specification 2D (§ 178.23 of this subchapter), not over 20½ pounds capacity each. Fiberboard boxes manufactured and marked for a gross weight of 65 pounds may have a gross weight of 70 pounds provided net weight of contents does not exceed 62 pounds. Inside containers and the completed package must be capable of withstanding the tests prescribed in paragraphs (c), (d), and (e) of this section.

(2) Specification 15A, 15B, or 19B (§§ 178.168, 178,169, 178.191 of this subchapter). Wooden boxes with inside metal or fiber cans not over 12 pounds capacity each, or paper bags, Spec. 2D (§ 178.23 of this subchapter), not over 20½ pounds capacity each. Inside containers must be capable of withstanding the tests prescribed in paragraphs (c) and (d) of this section.

(3) Spec. 5, 5B or 6C (§§ 178.80, 178.82, 178.99 of this subchapter). Metal barrels or drums.

(4) Spec. 17C, 17H or 37A (§§ 178.115, 178.118, or § 178.131 of this subchapter), metal drums (single-trip). Spec. 37A metal drums authorized for not over 100 pounds net weight.

(5) Spec. 21C (§ 178.224 of this subchapter). Fiber drums. Authorized net weight not over 250 pounds.

(b) Hexaethyl tetraphosphate mixtures, methyl parathion mixtures, organic phosphorus compound mixtures, organic phosphate compound mixtures, parathion mixtures, tetraethyl dithio pyrophosphate mixtures, and tetraethyl pyrophosphate mixtures in which the liquid is absorbed in concentrations greater than 27 percent in an inert dry material so as to form a dry mixture, must be packed in specification containers as follows:

(1) Spec. 12B or 12C (§§ 178.205 or 178.206 of this subchapter), fiberboard boxes, with inside containers which must be metal cans not over 12 pounds capacity each. Inside containers and the completed package must be capable of withstanding the tests prescribed in paragraphs (c), and (e) of this section.

(2) Specification 15A, 15B, or 19B (§§ 178.168, 178.169, 178.191 of this subchapter). Wooden boxes with inside metal cans not over 12 pounds capacity each. Inside containers must be capable of withstanding the tests prescribed in paragraph (c) of this section.

(3) Spec. 5, 5B or 6C (§§ 178.80, 178.82, or 178.99 of this subchapter). Metal barrels or drums.

(4) Spec. 17C, 17H, or 37A (§§ 178.115, 178.118, or 178.131 of this subchapter), metal drums (single-trip). Spec. 37A metal drums authorized for not over 100 pounds net weight.

(5) Specification 21C (§ 178.224 of this subchapter). Fiber drums. Authorized only for mixtures in which the liquid is absorbed in concentration not greater than 55 percent. Maximum net weight may not exceed 225 pounds.

(6) Specification 12B (§ 178.205 of this subchapter). Fiberboard box with inside Specification 2D (§ 178.23 of this subchapter) paper bags not over 5-pound capacity each and having an additional foil liner. Completed package may not exceed 65 pounds gross weight and must meet the test requirements of paragraphs (d) and (e) of this section. Authorized only for mixtures in which the liquid is absorbed in concentrations no greater than 67 percent.

(c) Inside metal or fiber cans when closed as for shipment must be capable of withstanding two four-foot drops onto solid concrete without breakage of the container or any sifting of the contents. One drop must be on side of can and the other diagonally on the top rim or chime.

(d) Inside paper bags when closed as for shipment must be capable of withstanding two four-foot drops onto solid concrete without breakage of the container or any sifting of the contents. One drop must be made on bottom of bag and the other on either large face.

(e) Completed packages when closed as for shipment must be capable of withstanding two four-foot drops onto solid concrete without breakage of the container or any sifting of the contents. One drop must be made on bottom of package and the other drop on the smallest adjacent side area.

(f) Dry mixtures containing not more than 2 percent by weight of hexaethyl tetraphosphate, methyl parathion, organic phosphorus compound mixtures, organic phosphate compound mixtures, parathion, tetraethyl dithio pyrophosphate, or tetraethyl pyrophasphate and in which the liquid is absorbed in an inert material, are excepted from specification packaging requirements of this part.

(g) Dry mixtures containing more than 2 percent but not exceeding 15 percent by weight of hexaethyl tetraphosphate, methyl parathion mixtures, organic phosphorus compound mixtures, organic phosphate compound mixtures, parathion, tetraethyl dithio pyrophosphate, or tetraethyl pyrophosphate, and in which the liquid is absorbed in an inert material, in addition to containers prescribed in paragraphs (a) and (b) of this section, may be packed in specification containers as follows:

(1) Spec. 44B (§ 178.236 of this subchapter). Multiwall paper bags with inside paper bags, Spec. 2D (§ 178.23 of this subchapter), not over 5 pounds capacity each. Net weight of material in

outside container not over 30 pounds each. Not authorized for transportation by air.

(2) Spec. 12B (§ 178.205 of this subchapter). Fiberboard boxes constructed of at least 275-pound test double-faced fiberboard and provided with a perimeter liner and top and bottom pad of at least 275-pound test fiberboard. Product must be contained within a tightly closed polyethylene or other equally efficient plastic bag constructed of material having minimum thickness of 0.003 inch. Not more than 50 pounds net weight of product may be packed in one outside box.

(h) Dry mixtures containing more than 2 percent but not exceeding 5 percent by weight of hexaethyl tetraphosphate, methyl parathion mixtures, organic phosphorus compound mixtures, organic phosphate compound mixtures, parathion, tetraethyl dithiopyrophosphate, or tetraethyl pyrophosphate, and in which the liquid is absorbed in an inert material, in addition to containers prescribed in paragraphs (a), (b), and (g) of this section, may be packed in specification containers as follows:

(1) Spec. 44D (§ 178.238 of this subchapter). Multiwall paper bags not over 50 pounds net weight each. Where extensible kraft is used the minimum total basis weight shall be 260 pounds. Not authorized for transportation by air.

(i) Dry mixtures containing more than 2 percent but not exceeding 12 percent by weight of hexaethyl tetraphosphate, methyl parathion mixtures, organic phosphorus compound mixtures, organic phosphate compound mixtures, parathion, tetraethyl dithio pyrophosphate or tetraethyl pyrophosphate, and in which the liquid is absorbed in an inert material, in addition to containers prescribed in paragraphs (a), (b), and (g) of this section, may be packed in specification containers as follows:

(1) Spec. 44D (§ 178.238 of this subchapter). Multiwall paper bags not over 50 pounds net weight each. Outer ply to be not less than 60 pounds basis weight. Not authorized for transportation by air.

(j) Dry mixture containing more than 2 percent but not exceeding 16.5 percent by weight of hexaethyl tetraphosphate, methyl parathion mixtures, organic phosphorus compound mixtures, organic phosphate compound mixtures, parathion, tetraethyl dithio pyrophosphate, or tetraethyl pyrophosphate, and in which the liquid is aborted in an inert material, in addition to containers prescribed in paragraphs (a) and (b) of this section, may be packed in specification containers as follows:

(1) Specification 44B (§ 178.236 of this subchapter). Multiwall paper bags having not more than 5 Specification 2D (§ 178.23 of this subchapter) inner bags, each fabricated with a foil liner and containing not more than ten pounds net weight. Maximum net weight of material in each outside container may not exceed 50 pounds. For water transportation, the material must also be in containers as prescribed in paragraph (j)(4) of this section or palletized and unit packed as prescribed in paragraph (j)(5) of this section. Not authorized for transportation by air.

(2) Specification 44D (§ 178.238 of this subchapter). Multiwall paper bags consisting of 6-ply extensible kraft paper having a minimum total basis weight of 320 pounds. Bags must have a metal foil inner liner and contain not over 60 pounds net weight. For transportation by water, material must be in containers as prescribed in paragraph (j)(4) of this section or palletized and unit packed as prescribed in paragraph (j)(5) of this section. Not authorized for transportation by air.

(3) Specification 44D (§ 178.238 of this subchapter). Multiwall paper bags consisting of 5-ply extensible kraft paper having a minimum total basis weight of 300 pounds. Bags may have outer sheet of 60 pound kraft in place of 70-pound basis weight but must have a metal foil inner liner. Maximum net weight may not exceed 54 pounds each. For transportation by water, material must be in containers as prescribed by paragraph (j)(4) of this section or palletized and unit packed as prescribed by paragraph (j)(5) of this section. Not authorized for transportation by air.

(4) Containers must be loaded and sealed at the shipper's plant or ware-

house and unsealed and unloaded only at the ultimate destination, unless the Coast Guard Captain of the Port desires to inspect the containers at his Port.

(5) Pallets must be designed to accommodate straps. The bags, fully enclosed by fiberboard or plastic film must be securely strapped to the pallet. The layer or layers of fiberboard or plastic film must fully protect the bags from excessive stress concentration caused by the strapping and normal handling loads.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53(e), App. A to Part 1)

[29 FR 18753, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

Editorial Note: For Federal Register citations affecting § 173.377, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.379 Cyanogen bromide.

Cyanogen bromide must be packaged in tightly closed metal inside containers not over 1-pound capacity each, securely cushioned and packaged in an outside wooden box. Net weight may not exceed 25 pounds in one outside packaging.

[Amdt. 173-94, 41 FR 16086, Apr. 15, 1976]

§ 173.381 Irritating materials; definition and general packaging requirements.

(a) For the purpose of Parts 170 through 189 of this subchapter, an irritating material is a liquid or solid substance which upon contact with fire or when exposed to air gives off dangerous or intensely irritating fumes, such as brombenzylcyanide, chloracetophenone, diphenylaminechlorarsine, and diphenylchlorarsine, but not including any poisonous material, Class A.

(b) *Cushioning.* All packagings must be hermetically closed. Inside packagings must be cushioned as prescribed when necessary to prevent breakage or leakage.

(c) *Outage.* No packaging used for the transportation of any liquid irritating material may be completely filled. For packagings with a capacity of 110 gallons or less, sufficient outage must be provided so the packaging will not be liquid full at 130° F. (55° C.).

(d) The transportation of an irritating material is not permitted if there is any type of interconnection between packagings.

(e) Any pressure in a cylinder at 130° F. (55° C.) must not exceed 5/4 the marked service pressure of the cylinder.

[29 FR 18753, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-70, 38 FR 5309, Feb. 27, 1973; Amdt. 173-94, 41 FR 16086, Apr. 15, 1976]

§ 173.382 Irritating materials, not specifically provided for.

(a) Irritating materials, as defined in § 173.381 for which special packaging is not otherwise prescribed, except as provided in paragraph (b) of this section, must be packaged as follows:

(1) Spec. 5, 5A, 5B or 5C (§ 178.80, 178.81, 178.82 or § 178.83 of this subchapter) metal barrels or drums; or spec. 17C (single-trip) (§ 178.115 of this subchapter) metal drums not over 5 gallons capacity each.

(2) Spec. 6B or 6C (§§ 178.98, 178.99 of this subchapter). Metal barrels or drums.

(3) Specification 15A, 15B, or 19B (§§ 178.168, 178.169, 178.191 of this subchapter). Wooden boxes with inside metal containers not over 1-gallon capacity each. Net weight not to exceed 80 pounds in one outside box.

(4) Cylinders as prescribed for any compressed gas, except acetylene are also authorized for use. These cylinders must be qualified maintained and filled in accordance with §§ 173.34 and 173.301(g), if used for material with pressure exceeding 25 pounds per square inch at 70° F., they must also be retested as required by § 173.34.

(b) Chloroacetophene, diphenylamine-chloroarsine, irritating material, n.o.s., or xylyl bromide, charged with a non-flammable gas exceeding 25 psig at 70° F. must be packaged as specified in paragraph (a)(4) of this section.

[29 FR 18753, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

Editorial Note: For Federal Register citations affecting § 173.382, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.383 Chemical ammunition.

(a) Chemical ammunition consisting of projectiles, shells, bombs, or other containers, except grenades, filled with an irritating material without ignition elements, bursting charges, detonating fuzes, or other explosive components, must be packaged for shipment in strong outside wooden or metal boxes. Boxes must be marked with name of contents and labeled as prescribed in this part for gases, liquids, or chemicals contained therein.

(b) Chemical ammunition, when shipped as such must not be equipped or packed with explosive or ignition elements (see §§ 173.53(r) and 173.59 for explosive chemical ammunition).

[29 FR 18753, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 173-70, 38 FR 5309, Feb. 27, 1973]

§ 173.384 Monochloracetone, stabilized.

(a) Monochloracetone, stabilized, must be packed in specification containers as follows:

(1) Specification 5, 5A, or 17C (single-trip) (§§ 178.80, 178.81, 178.115 of this subchapter). Metal barrels or drums.

(2) Specification 15A, 15B, 15C, 16A, or 19B (§§ 178.168, 178.169, 178.170, 178.185, 178.191 of this subchapter). Wooden boxes with inside glass bottles or tubes in metal cans hermetically sealed or with covers securely taped. The metal cans must be in corrugated fiberboard cartons, Specification 2C (§ 178.22 of this subchapter). Bottles must not contain more than 1 pound of liquid each, must not be filled to more than 95 percent capacity, must be tightly and securely closed, and must be cushioned in cans with at least one-half inch of absorbent material. Cans must be made of metal at least 32-gauge U.S. Standard. The total amount of liquid per package must not exceed 24 pounds.

[Amdt. 173-94B, 41 FR 57070, Dec. 30, 1976; 42 FR 2071, Jan. 10, 1977, as amended by Amdt. 173-149, 46 FR 49905, Oct. 8, 1981]

§ 173.385 Tear gas grenades, tear gas candles, or similar devices.

(a) Tear gas grenades, tear gas candles, or similar devices containing lachrymatory (tear producing) substances, for civil or military use must be packed in specification containers as follows (see § 173.101(d) and (e) for packing tear gas cartridges):

(1) Specification 15A, 15B, 15C, or 19B (§§ 178.168, 178.169, 178.170, 178.191 of this subchapter). Metal-strapped wooden boxes. Functioning elements not assembled in grenades or devices must be in a separate compartment of these boxes, or in inside or separate outside boxes, Spec. 15A, 15B, 15C, or 19B and must be so packed and cushioned that they may not come in contact with each other or with the walls of box during transportation. Not more than 50 grenades and 50 functioning devices shall be packed in one box and the gross weight of the outside box must not exceed 75 pounds.

(2) Spec. 37A (§ 178.131 of this subchapter). Metal drum (single-trip). Functioning elements must be packed in separate compartment. Not more than 24 grenades and 24 functioning devices shall be packed in one outside container and the gross weight of the container must not exceed 75 pounds.

(3) Specification 12B (§ 178.205 of this subchapter). Fiberboard box with inside tear gas devices meeting Specifications 2P or 2Q (§§ 178.33, 178.33a of this subchapter). Each inside container must be placed into spiral wound tubes fitted with metal ends or a double-faced fiberboard box with suitable padding. Not more than 30 inside containers shall be placed in one outside box and gross weight shall not exceed 35 pounds.

(b) These articles may not be assembled with or packed in the same compartment with mechanically or manually operated firing, igniting, bursting, or other functioning elements, unless of a type or design examined by the Bureau of Explosives and approved by the Director, OHMT.

(c) No shipment of packages containing articles under this section may be made until samples thereof have been examined by the Bureau of Explosives, or examined under their supervision, and approved by the Director, OHMT.

NOTE 1. Grenades or other similar devices may be shipped completely assembled when offered by or consigned to the U.S. Department of Defense, provided the functioning element is so packed that it cannot accidentally function. The outside containers must be metal-strapped wooden boxes, Spec. 15A, 15B, 15C, or 19B (§§ 178.168, 178.169, 178.170, 178.191 of this subchapter).

[29 FR 18753, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 173.385, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 173.386 Etiologic agents; definition and scope.

(a) *Definition.* For the purpose of Parts 170 through 189 of this subchapter:

(1) An "etiologic agent" means a viable microorganism, or its toxin, which causes or may cause human disease, and is limited to those agents listed in 42 CFR 72.3 of the regulations of the Department of Health and Human Services.

(2) A "diagnostic specimen" means any human or animal material including, but not limited to, excreta, secreta, blood, and its components, tissue, and tissue fluids, being shipped for purposes of diagnosis.

(3) A "biological product" means a material prepared and manufactured in accordance with the provisions of 9 CFR Part 102 (Licensed veterinary biological products), 21 CFR Part 601 (Licensing), 21 CFR 312.1 (Conditions for exemption of new drugs for investigational use), 9 CFR Part 103 (Biological products for experimental treatment of animals), or 21 CFR 312.9 (New drugs for investigational use in laboratory research animals or in vitro tests), and which in accordance with these provisions, may be shipped in interstate commerce.

(b) *Applicability.* Except as provided in paragraph (d), no person may ship any material, including a diagnostic specimen or a biological product, containing an etiologic agent unless this material is packaged and prepared for shipment in accordance with § 173.24 and the other applicable regulations of this subchapter.

(c) *General provisions.* The requirements of these regulations (Parts 170 through 189 of this subchapter) supplement the requirements of the Department of Health and Human Service's regulations contained in 42 CFR Part 72.

(d) *Exceptions.* The following substances are not subject to any requirements of this subchapter if the items as packaged do not contain any material otherwise subject to the requirements of Parts 170 through 189 of this subchapter:

(1) Diagnostic specimens.

(2) Biological products.

(3) Cultures of etiologic agents of 50 milliliters (1.666 fluid ounces) or less total quantity in one outside package.

[Amdt. 173-67, 37 FR 20555, Sept. 30, 1972, as amended by Amdt. 173-72, 38 FR 8162, Mar. 29, 1973; Amdt. 173-94B, 41 FR 57070, Dec. 30, 1976; Amdt. 173-121, 43 FR 48644, Oct. 19, 1978; Amdt. 173-16, 48 FR 50460, Nov. 1, 1983]

§ 173.387 Packaging requirements for etiologic agents.

(a) Except as provided in § 173.386(d) no person may ship a package containing over 4 liters gross volume of an etiologic agent.

(b) In addition to the requirements of 42 CFR Part 72, each package containing an etiologic agent must be designed and constructed so that, if it were subject to the environment and test conditions prescribed in this section, there would be no release of the contents to the environment, and the effectiveness of the packaging would not be significantly reduced.

(1) *Environmental conditions.* (i) Heat—direct sunlight in an ambient temperature of 130° F. in still air.

(ii) Cold—an ambient temperature of −40° F. in still air and shade.

(iii) Reduced pressure—ambient atmospheric pressure of 0.50 atmosphere (7.3 p.s.i.a.).

(iv) Vibration—vibration normally incident in the mode of transportation the package is to be shipped.

(2) *Test conditions.* (i) Water spray—a water spray heavy enough to keep the entire exposed surface of the package (except the bottom) continuously wet during a period of 30 minutes. Packages for which the outer layer consists of metal, wood, ceramic, or plastic, or combination thereof, are exempt from this test.

(ii) Freedrop—a freedrop through a distance of 30 feet onto a flat, essentially unyielding horizontal target surface, the package striking the surface in a position for which maximum damage is expected.

(iii) Penetration—impact of the hemispheric end of a steel cylinder 1.25 inches in diameter and weighing 15 pounds, dropped from a height of 40 inches on to the exposed surface of the package expected to be most vulnerable to puncture. The long axis of the cylinder must be perpendicular to the impacted surface. This test is not required for a package subject to paragraph (b)(2)(iv) of this section.

(iv) Penetration (required for packages exceeding 15 pounds gross weight only)—a freedrop of the package through a distance of 40 inches, striking the top end of a vertical cylindrical mild steel solid bar on an essentially unyielding surface, in a position for which maximum damage is expected. The bar must be 1.5 inches in diameter. The top of the bar must be horizontal, with its edge rounded to a radius not exceeding one-quarter inch. The bar must be of such length as to cause maximum damage to the package, but not less than 8 inches long. The long axis of the bar must be vertical to the unyielding horizontal impact surface of the package.

(3) *Testing procedure.* (i) At least one sample of each type package (maximum size and gross weight), filled with water, must be subjected to the water spray test unless exempted by paragraph (b)(2)(i) of this section.

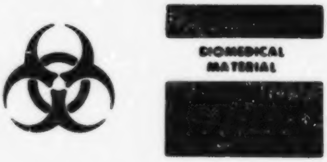
(ii) This sample package then must be given the freedrop and one of the penetration tests, as applicable. Separate wetted sample packages may be used for the freedrop and the penetration test.

(iii) If the sample package is exempted from the water spray test by paragraph (b)(2)(i) of this section, at least one sample of each type package (maximum size and gross weight), filled with water, must be subjected consecutively to the freedrop and the penetration test.

[Amdt. 173-67, 37 FR 20556, Sept. 30, 1972, as amended by Amdt. 173-16, 48 FR 50460, Nov. 1, 1983]

§ 173.388 Labeling of packages containing etiologic agents.

(a) Each package containing an etiologic agent, except a diagnostic specimen or a biological product, must be labeled as prescribed by the regulations of the Department of Health and Human Services, 42 CFR 72.3(d). For information, this label is required to be a rectangle measuring 51 mm. (2 inches) high and 102.5 mm. (4 inches) long, predominantly red printing on a white background, and appears as follows:



(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 173-67, 37 FR 20556, Sept. 30, 1972, as amended by Amdt. 173-16, 48 FR 50460, Nov. 1, 1983; Amdt. 173-178, 49 FR 38134, Sept. 27, 1984]

Subpart I—Radioactive Materials

AUTHORITY: 49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1.

SOURCE: Amdt. 173-162, 48 FR 10226, Mar. 10, 1983, unless otherwise noted.

§ 173.401 Scope.

(a) This subpart sets forth requirements for the transportation of radioactive materials by carriers and shippers subject to this subchapter. The requirements prescribed in this subpart are in addition to, but not in lieu of, other requirements set forth in this subchapter and in 10 CFR Part 71 for the packaging and transportation of radioactive materials.

(b) This subpart does not apply to:

(1) Radioactive materials produced, used, transported, or stored within an establishment other than during the course of transportation.

(2) Radioactive materials contained in a medical device, such as a heart pacemaker, which is implanted in a human being or live animal.

(3) Radiopharmaceuticals that have been injected into, or ingested by, and are still in human beings or live animals.

§ 173.403 Definitions.

In this subpart:

(a) "A_1" means the maximum activity of special form radioactive material permitted in a Type A package.

(b) "A_2" means the maximum activity of radioactive material, other than special form or low specific activity radioactive material, permitted in a Type A package. These values are either listed in § 173.435 or may be derived in accordance with the procedure prescribed in § 173.433.

(c) "Closed transport vehicle" means a transport vehicle equipped with a securely attached exterior enclosure that during normal transportation restricts the access of unauthorized persons to the cargo space containing the radioactive materials. The enclosure may be either temporary or permanent, and in the case of packaged materials may be of the "see-through" type, and must limit access from top, sides, and ends.

(d) "Containment system" means the components of the packaging intended to retain the radioactive contents during transportation.

(e) "Conveyance" means:

(1) For transport by public highway or rail: any transport vehicle or large freight container;

(2) For transport by vessel: any vessel, or any hold, compartment, or defined deck area of a vessel; and

(3) For transport by aircraft: any aircraft.

(f) "Depleted uranium" means uranium containing less uranium-235 than the naturally occurring distribution of uranium isotopes.

(g) "Design" means the description of a special form material, a package, or a packaging, that enables those items to be fully identified. The description may include specifications, engineering drawings, reports showing compliance with regulatory requirements, and other relevent documentation.

(h) "Enriched uranium" means uranium containing more uranium-235 than the naturally occurring distribution of uranium isotopes.

(i) "Exclusive use" (also referred to in other regulations as "sole use" or "full load") means the sole use of a conveyance by a single consignor and for wh9ch all initial, intermediate, and final loading and unloading are carried out in accordance with the direction of the consignor or consignee. Any loading or unloading must be performed by personnel having radiological training and resources appropriate for safe handling of the consignment. Specific instructions for maintenance of exclusive use shipment controls must be issued in writing and included with the shipping paper information provided to the carrier by the consignor.

(j) "Fissile material" means any material consisting of or containing one or more fissile radionuclides. Fissile radionuclides are plutonium-238, plutonium-239, plutonium-241, uranium-233 and uranium-235. Neither natural nor depleted uranium are fissile material. Fissile materials are classified according to the controls needed to provide nuclear criticality safety during transportation, as provided in § 173.455. Certain exclusions are provided in § 173.453.

(k) "Freight container" means a reusable container having a volume of 1.81 cubic meters (64 cubic feet) or more, designed and constructed to permit being lifted with its contents intact and intended primarily for containment of packages in unit form during transportation. A small freight container is one which has either one outer dimension less than 1.5 meters (4.9 feet) or an internal volume of not more than 3.0 cubic meters (106 cubic feet). All other are designated as "large freight containers."

(l) "Highway route controlled quantity" means a quantity within a single package which exceeds:

(1) 3000 times the A_1 value of the radionuclides as specified in § 173.433 for special form radioactive material;

(2) 3000 times the A_2 value of the radionuclides as specified in § 173.433 for normal form radioactive material; or

(3) 30,000 curies, whichever is least.

(m) "Limited quantity of radioactive material" means a quantity of radioactive material not exceeding the materials package limits specified in § 173.423 and which conform with requirements specified in § 173.421.

(n) "Low specific activity material (LSA)" means any of the following:

(1) Uranium or thorium ores and physical or chemical concentrates of those ores.

(2) Unirradiated natural or depleted uranium or unirradiated natural thorium.

(3) Tritium oxide in aqueous solutions provided the concentration does not exceed 5.0 millicuries per milliliter.

(4) Material in which the radioactivity is essentially uniformly distributed and in which the estimated average concentration of contents does not exceed:

(i) 0.0001 millicurie per gram of radionuclides for which the A_2 quantity is not more than .05 curie;

(ii) 0.005 millicurie per gram of radionuclides for which the A_2 quantity is more than .05 curie, but not more than 1 curie; or

(iii) 0.3 millicurie per gram of radionuclides for which the A_2 quantity is more than 1 curie.

(5) Objects of nonradioactive material externally contaminated with radioactive material, provided that the radioactive material is not readily dispersible and the surface contamination, when averaged over an area of 1 square meter, does not exceed 0.0001 millicurie (220,000 disintegrations per minute) per square centimeter of radionuclides for which the A_2 quantity is not more than .05 curie, or 0.001 millicurie (2,200,000 disintegrations per minute) per square centimeter for other radionuclides.

(o) "Multilateral approval" means approval by both the appropriate competent authority of the country of origin and of each country through or into which the shipment is to be transported. This definition does not imply approval from countries over which radioactive materials are carried in aircraft, if there is no scheduled stop in that country.

(p) "Natural thorium" means thorium with the naturally occuring distribution of thorium isotopes (essentially 100 weight percent thorium-232).

(q) "Natural uranium" means uranium with the naturally occuring distribution of uranium isotopes (approximately 0.711 weight percent uranium-235 and the remainder essentially uranium-238).

(r) "Non-fixed radioactive contamination" means radioactive contamination that can be readily removed from a surface by wiping with an absorbent material. Non-fixed (removable) radioactive contamination is not significant if it does not exceed the limits specified in § 173.443.

(s) "Normal form radioactive material" meams radioactive material which has not been demonstrated to qualify as "special form radioactive material."

(t) "Package" means, for radioactive materials, the packaging together with its radioactive contents as presented for transport.

(u) "Packaging" means, for radioactive materials, the assembly of components necessary to ensure compliance with the packaging requirements of this subpart. It may consist of one or more receptacles, absorbent materials, spacing structures, thermal insulation, radiation shielding, and devices for cooling or absorbing mechanical shocks. The conveyance, tie-down system, and auxiliary equipment may sometimes be designated as part of the packaging.

(v) "Radiation level" means the radiation dose-equivalent rate expressed in millirem per hour (mrem/h). Neutron flux densities may be converted into radiation levels according to Table 1:

TABLE 1—NEUTRON FLUX DENSITIES TO BE REGARDED AS EQUIVALENT TO A RADIATION LEVEL OF 1 MILLIREM PER HOUR (MREM/H)[1]

Energy of neutron	Flux density equivalent to 1 mrem/h (Neutrons per square centimeter per second)(n/cm²/s)
Thermal	268.0
5 keV	228.0
20keV	112.0
100 keV	32.0
500 keV	12.0
1 MeV	7.2
5 MeV	7.2
10 MeV	6.8

[1] Flux densities equivalent for energies between those listed above may be obtained by linear interpolation.

(w) "Radioactive article" means any manufactured instruments and articles such as an instrument, clock, electronic tube or apparatus, or similar instruments and articles having radioactive material as a component part.

(x) "Radioactive contents" means the radioactive material, together with any contaminated liquids or gases, within the package.

(y) "Radioactive material" means any material having a specific activity greater than 0.002 microcuries per gram (uCi/g)(see definition of "specific activity").

(z) "Special form radioactive material" means radioactive material which satisfies the following conditions:

(1) It is either a single solid piece or is contained in a sealed capsule that can be opened only by destroying the capsule;

(2) The piece or capsule has at least one dimension not less than 5 millimeters (0.197 inch); and

(3) It satisfies the test requirements of § 173.469. Special form encapsulations designed in accordance with the requirements of § 173.389(g) in effect on June 30, 1983, and constructed prior to July 1, 1985 may continue to be used. Special form encapsulations either designed or constructed after June 30, 1985 must meet the requirements of this paragraph.

(aa) "Specific activity" of a radionuclide, means the activity of the radionuclide per unit mass of that nuclide. The specific activity of a material in which the radionuclide is essentially uniformly distributed is the activity per unit mass of the material.

(bb) "Transport index" means the dimensionless number (rounded up to the first decimal place) placed on the label of a package to designate the degree of control to be exercised by the carrier during transportation. The transport index is determined as follows:

(1) The number expressing the maximum radiation level in millirem per hour at one meter (3.3 feet) from the external surface of the package; or

(2) For Fissile Class II packages or packages in a Fissile Class III shipment, the number expressing the maximum radiation level at one meter (3.3 feet) from the external surface of the package, or the number obtained by dividing 50 by the allowable number of packages which may be transported together, whichever is larger.

(cc) "Type A package" means a Type A packaging together with its limited radioactive contents. A Type A package does not require competent authority approval, since its contents are limited to A_1 or A_2.

(dd) "Type B package" means a Type B packaging together with its radioactive contents.

(ee) "Type B(M) package" means a Type B packaging, together with its radioactive contents, that for international shipments requires multilateral approval of the package design, and may require approval of the conditions of shipment. Type B(M) packages are those Type B package designs which have a maximum normal operating pressure of more than 7 kilograms per square centimeter (100 pounds per square inch) gauge or a relief device which would allow the release of radioactive material to the environment under the hypothetical accident conditions specified in 10 CFR Part 71.

(ff) "Type B(U) package" means a Type B packaging, together with its radioactive contents, that for international shipments, requires unilateral approval only of the package design and of any stowage provisions that may be necessary for heat dissipation.

(gg) "Type A packaging" means a packaging designed to retain the integrity of containment and shielding required by this part under normal conditions of transport as demonstrated by the tests set forth in §§ 173.465 or 173.466, as appropriate.

(hh) "Type B packaging" means a packaging designed to retain the integrity of containment and shielding required by this part when subjected to the normal conditions of transport and hypothetical accident test conditions set forth in 10 CFR Part 71.

(ii) "Uncompressed gas" means, for the purposes of this subpart, gas at a pressure not exceeding the ambient atmospheric pressure at the time and location the containment system is closed. All other radioactive gases are considered to be compressed.

(jj) "Unilateral approval" means approval by the competent authority of the country of origin only.

(kk) "Unirradiated thorium" means thorium containing not more than 10^{-7} grams uranium-233 per gram of thorium-232.

(ll) "Unirradiated uranium" means uranium containing not more than 10^{-6} grams plutonium per gram of uranium-235 and a fission product activity of not more than 0.25 millicuries of fission products per gram of uranium-235.

[Amdt. 173-162, 48 FR 10226, Mar. 10, 1983; 48 FR 13431, Mar. 31, 1983, as amended at 48 FR 31217, July 7, 1983; Amdt. 173-193, 50 FR 41898, Oct. 16, 1985]

EFFECTIVE DATE NOTE: Section 173 403 was amended at 50 FR 41898, Oct. 16, 1985, by adding a new sentence at the end of the first sentence in paragraph (i), effective December 1, 1985.

§ 173.411 General design requirements.

Except for a package that contains a limited quantity or excepted instrument or article under §§ 173.421 through 173.424, each package used for shipment of radioactive materials shall be designed so that:

(a) The package can be easily handled and properly secured in or on a conveyance during transport;

(b) A package with a gross weight exceeding 10 kilograms (22 pounds) and up to 50 kilograms (110 pounds) has a means for manual handling;

(c) A package with a gross weight of 50 kilograms (110 pounds) or more can be safely handled by mechanical means;

(d) Each lifting attachment on the package, when used in the intended manner, with a minimum safety factor of three, does not impose an unsafe stress on the structure of the package. In addition, the lifting attachment shall be so designed that failure under excessive load would not impair the ability of the package to meet all other requirements of this subpart. Each attachment or other feature on the outer surface of the packaging that could be used to lift the package must be removable or otherwise capable of being made inoperable for transport, or shall be designed with strength equivalent to that required for lifting attachments;

(e) The external surface, as far as practicable, may be easily decontaminated;

(f) The outer layer of packaging will avoid, as far as practicable, pockets or crevices where water might collect; and

(g) Each feature that is added to the package at the time of transport, and that is not a part of the package, will not reduce the safety of the package.

[Amdt. 173-162, 48 FR 10226, Mar. 10, 1983, as amended at 48 FR 31218, July 7, 1983]

§ 173.412 Additional design requirements for Type A packages.

In addition to meeting the general design requirements prescribed in § 173.411, each Type A packaging shall be designed so that:

(a) The smallest overall external dimension of the package is not less than 10 centimeters (4 inches);

(b) The outside of the packaging incorporates a feature, such as a seal, that is not readily breakable, and that, while intact, is evidence that the package has not been opened. In the case of packages shipped in exclusive use closed transport vehicles, the cargo compartment may be sealed instead of the individual packages;

(c) As far as practicable, the external surfaces are free from protrusions and are designed and finished so that they can be easily decontaminated;

(d) Containment and shielding would be maintained during transportation and storage in a temperature range of −40°C (−40°F) to 70°C (158°F) with account being taken of the possibility of brittle fracture;

(e) It is able to withstand the effects of any acceleration, vibration, or vibration resonance that may arise during normal transportation, without any deterioration of the effectiveness of closing devices or of the integrity of the package as a whole and without loosening or unintentional release of nuts, bolts, or other securing devices even after repeated use;

(f) It includes a containment system securely closed by a positive fastening device that cannot be opened unintentionally or by pressure that may arise within the package during normal transport. Special form, as demonstrated in accordance with § 173.469 may be considered as a component of the containment system;

(g) The materials of the packaging and any components or structures are physically and chemically compatible with each other and with the contents, taking into account the behavior of each under irradiation;

(h) For each component of the containment system account is taken, where applicable, of radiolytic decomposition of materials and the generation of gas by chemical reaction and radiolysis;

(i) The containment system will retain its radioactive contents under the reduction of ambient pressure to .25 kilograms per square centimeter (3.5 pounds per square inch);

(j) Each valve through which the radioactive contents could otherwise escape is protected against damage and unauthorized operation and, except for a pressure relief device, has an enclosure to retain any leakage;

(k) Any radiation shield that encloses a component of the packaging specified as part of the containment system will prevent the unintentional escape of that component from the shield;

(l) Failure of any tie down attachment on the packaging under excessive load will not impair the ability of the package to meet other requirements of this subpart;

(m) When subjected to the tests specified in § 173.465 or evaluated against these tests by any of the methods authorized by § 173.461(a), the packaging will prevent:

(1) Loss or dispersal of the radioactive contents; and

(2) Any significant increase in the radiation levels recorded or calculated at the external surfaces for the condition before the test;

(n) Each packaging designed for liquids will:

(1) Meet the conditions prescribed in paragraph (m) of this section when subjected to the tests specified in § 173.466 or evaluated against these tests by any of the methods authorized by § 173.461(a);

(2) For any package with a liquid volume not exceeding 50 cubic centimeters (1.7 fluid ounces), have sufficient suitable absorbent material to absorb twice the volume of the liquid contents. The absorbent material shall be compatible with the package contents and suitably positioned to contact the liquid in the event of leakage; and

(3) For any package with a liquid volume exceeding 50 cubic centimeters (1.7 fluid ounces), either:

(i) Have sufficient absorbent material as prescribed in paragraph (n)(2) of this section; or

(ii) Have a containment system composed of primary inner and secondary outer containment components designed to assure retention of the liquid contents within the secondary outer components in the event that the primary inner components leak; and

(o) Each package designed for compressed or uncompressed gases other than tritium or argon-37 not exceeding 200 curies will be able to prevent loss of contents when the package is subjected to the tests prescribed in § 173.466 or evaluated against these tests by any of the methods authorized by § 173.461(a).

[Amdt. 173-162, 48 FR 10226, Mar. 10, 1983, as amended at 48 FR 31218, July 7, 1983]

§ 173.413 Requirements for Type B packages.

Each Type B(U) or Type B(M) package must be designed and constructed to meet the applicable requirements in 10 CFR Part 71.

§ 173.415 Authorized Type A packages.

The following packages are authorized for shipment, if they do not contain quantities exceeding A_1 or A_2 as appropriate:

(a) U.S. Department of Transportation (DOT) Specification 7A (§ 178.350 of this subchapter) Type A general packaging. Each shipper of a Specification 7A package must maintain on file for at least one year after the latest shipment, and shall provide to DOT on request, a complete documentation of tests and an engineering evaluation or comparative data showing that the construction methods, packaging design, and materials of construction comply with that specification. Specification 7A packagings designed in accordance with the requirements of § 178.350 in effect on June 30, 1983, and constructed prior to July 1, 1985, may continue to be used. Packagings either designed or constructed after June 30, 1985, must meet the requirements of § 178.350 applicable at the time of their design or construction.

(b) DOT Specification 55 metal-encased shielded packaging constructed before April 1, 1975. Such packaging constructed after March 31, 1975 is not authorized unless it is requalified under DOT Specification 7A. Each packaging designed for liquids must also meet the requirements of § 173.412 (m) and (n). Use of this packaging as DOT Specification 55 is not authorized after June 30, 1985.

(c) Any Type B(U) or B(M) packaging, pursuant to § 173.416.

(d) Any foreign made packaging that bears the marking "Type A" and which was used for the import of radioactive materials. Such packagings may be subsequently used for domestic and export shipments of radioactive materials. These packagings shall conform with requirements of the country of origin (as indicated by the packaging marking) applicable to Type A packagings.

(The information collection requirements contained in paragraph (a) were approved by the Office of Management and Budget under control number 2137-0533)

[Amdt. 173-162, 48 FR 10226, Mar. 10, 1983, as amended at 48 FR 31218, July 7, 1983]

§ 173.416 Authorized Type B packages.

Each of the following packages is authorized for shipment of quantities exceeding A_1 or A_2, as appropriate:

(a) DOT Specification 55 metal-encased shielded packaging constructed before April 1, 1975, for domestic shipments only of special form radioactive materials of 300 curies or less. Such packaging constructed after March 31, 1975 may not be designated as DOT Specification 55. Use of this packaging is not authorized after June 30, 1985 unless approved in accordance with paragraph (b) of this section.

(b) Any Type B, Type B(U) or Type B(M) packaging that meets the applicable requirements in the regulations of the U.S. Nuclear Regulatory Commission (10 CFR Part 71) and that has been approved by that Commission may be shipped pursuant to § 173.471.

(c) Any type B(U) or B(M) packaging that meets the applicable requirements of the regulations of the International Atomic Energy Agency (IAEA) in its "Regulations for the Safe Transport of Radioactive Materials, Safety Series No. 6, 1973 Revised Edition (as amended)" and for which the foreign competent authority certificate has been revalidated by DOT pursuant to § 173.473. Authorized only for export and import shipments.

(d) DOT Specification 6M (§ 178.104 of this subchapter) metal packaging, only for solid or gaseous radioactive materials that will not undergo pressure generating decomposition at temperatures up to 121°C (250° F) and that do not generate more than 10 watts of radioactive decay heat

(e) For contents in other than special form; DOT Specification 20 WC (§ 178.194 of this subchapter), wooden protective jacket, when used with a single, snug-fitting inner DOT Specification 2R (§ 178.34 of this subchapter), or a DOT Specification 55 container constructed prior to April 1, 1975. Such packagings constructed after March 31, 1975, may not be designated as DOT Specification 55. For liquid contents, the inner packaging must comply with § 173.412 (m) and (n).

(f) For contents in special form only; DOT Specification 20WC (§ 178.194 of this subchapter), wooden protective jacket, with a single snug-fitting inner Type A packaging that has a metal outer wall and conforms to § 178.350 of this subchapter, or an inner DOT Specification 55 packaging constructed prior to April 1, 1975. Such packagings constructed after March 31, 1975, may not be designated as DOT Specification 55. Radioactive decay heat may not exceed 100 watts.

(g) For contents in special form only; DOT Specification 21WC (§ 178.195 of this subchapter), wooden protective overpack, with a single inner DOT Specification 2R (§ 178.34 of this subchapter) or an inner DOT Specification 55 container constructed prior to April 1, 1975. Such packagings constructed after March 31, 1975, may not be designated as DOT Specification 55. Contents shall be loaded within the inner packaging in such a manner as to prevent loose movement during transportation. The inner packaging shall be securely positioned and centered within the overpack so that there will be no significant displacement of the inner packaging if subjected to the 9 meter (30 feet) drop test described in 10 CFR Part 71.

[Amdt. 173-162, 48 FR 10226, Mar. 10, 1983, as amended at 48 FR 31218, July 7, 1983]

§ 173.417 Authorized packaging—fissile materials.

(a) Except as provided in § 173.453, fissile materials containing not more than A_1 or A_2 as appropriate, shall be packaged in one of the following packagings:

(1) DOT Specification 6L (§ 178.103 of this subchapter), metal packaging, for materials prescribed in paragraph (b)(1) of this section.

(2) DOT Specification 6M (§ 178.104 of this subchapter), metal packaging, for materials prescribed in paragraph (b)(2) of this section.

(3) Any packaging listed in § 173.415, limited to the following radioactive materials:

(i) 500 grams of uranium-235 in a single shipment as Fissile Class III or not more than 40 grams of uranium-235 per package as Fissile Class II. For Fissile Class II shipments, the transport index assigned to each package shall not be less than 0.4 for each gram of uranium-235 above 15 grams up to the maximum of 40 grams (transport index of 10).

(ii) 320 grams of plutonium-239 as plutonium-beryllium neutron sources in special form. Total radioactivity content may not exceed 20 curies. The transport index to be assigned to each package must be 0.5 for each 20 grams, or fraction thereof, of fissile plutonium.

(4) Any other Type A or Type B, Type B(U), or Type B(M) packaging for fissile radioactive materials that also meets the applicable standards for fissile materials in the regulations of the U.S. Nuclear Regulatory Commission (10 CFR Part 71), and is used in accordance with § 173.471.

(5) Any other Type A or Type B, Type B(U), or Type B(M) packaging that also meets the applicable requirements for fissile material packaging in Section VI of the International Atomic Energy Agency "Regulations for the Safe Transport of Radioactive Materials, Safety Series No. 6, 1973 Revised Edition (as amended)", and for which the foreign competent authority certificate has been revalidated by the Director, OHMT, in accordance with § 173.473. Authorized only for export and import shipments.

(6) A DOT Specification 6J (§ 178.100 of this subchapter) or 17H (§ 178.118 of this subchapter) 55-gallon steel drum, subject to the following conditions:

(i) The quantity may not exceed 350 grams of uranium-235 in any non-pyrophoric form, enriched to any degree in the uranium-235 isotope.

(ii) Each drum must have a minimum 18 gauge body and bottom head and 16 gauge removable top head with one or more corrugations in the cover near the periphery.

(iii) Closure must conform to § 178.103-5(a) of this subchapter.

(iv) At least four equally spaced 12 millimeter (0.5 inch) diameter vent holes shall be provided on the sides of the drum near the top, each covered with weatherproof tape; or equivalent device.

(v) Appropriate primary inner containment of the contents and sufficient packaging material, such as plastic or metal jars or cans shall be provided such that Specification 7A (§ 178.350 of this subchapter) provisions are satisfied by the inner packaging.

(vi) Each inner container shall be capable of venting if subjected to the thermal test described in 10 CFR Part 71.

(vii) Liquid contents shall be packaged in accordance with § 173.412(m) and (n).

(viii) The maximum weight of contents including internal packaging may not exceed 91 kilograms (200 pounds) with fissile material content limited as shown in Table 2:

TABLE 2—FISSILE MATERIAL CONTENT AND TRANSPORT INDEX FOR SPECIFICATION 6J OR 17H PACKAGES

Maximum U-235 per package (grams)	Minimum transport index per package as Fissile Class II	Maximum packages per transport vehicle as Fissile Class III
350	1.8	72
300	1.0	129
250	0.5	256
200	0.3	500
150	0.1	500
100	0.1	500
50	(¹)	(¹)

[1] Fissile Class I.

(7) Any metal cylinder that meets the performance requirements of §§ 173.415 and 178.350 of this subchapter for Specification 7A Type A packaging may be used as a Fissile Class I package for the transport of residual "heels" of enriched solid uranium hexafluoride without a protective overpack in accordance with Table 3:

TABLE 3—ALLOWABLE CONTENT OF URANIUM HEXAFLUORIDE (UF$_6$) "HEELS" IN A SPECIFICATION 7A CYLINDER

Maximum cylinder diameter		Cylinder volume		Maximum Uranium-235 enrichment (weight percent)	Maximum "heel" weight per cylinder			
					UF$_6$		Uranium-235	
Inches	Centimenters	Cubic Feet	Liters		kg	(lb)	kg	(lb)
5	12.7	0.311	8.8	100.0	0.045	0.1	0.031	0.07
8	20.3	1.359	39	12.5	0.227	0.5	.019	0.04
12	30.5	2.410	68	5.0	0.454	1.0	.015	0.03
30	76	25.64	725	5.0	11.3	25.0	.383	0.84
48	122	108.9 (10 ton)	3084	4.5	22.7	50	.690	1.52
		142.7 (14 ton)	4041	4.5	22.7	50	.690	1.52

(8) DOT Specifications 20PF-1, 20PF-2, or 20PF-3 (§ 178.120 of this subchapter) or Specifications 21PF-1 or 21PF-2 (§ 178.121 of this subchapter) phenolic-foam insulated overpack with snug fitting inner metal cylinders, for materials prescribed in paragraph (b)(5) of this section.

(b) Fissile radioactive materials with radioactive content exceeding A_1 or A_2 shall be packaged in one of the following packagings:

(1) DOT Specification 6L (§ 178.103 of this subchapter), metal packaging. Authorized only for uranium-235, plutonium-239 or plutonium-241, as metal, oxide, or compounds that do not decompose at temperatures up to 149°C (300°F). Radioactive decay heat output may not exceed 5 watts. Radioactive materials in normal form shall be packaged in one or more tightly sealed metal cans or polyethylene bottles within a DOT Specification 2R (§ 178.34 of this subchapter) containment vessel. Packages are authorized as Fissile Class II and III with materials limited in accordance with Table 4:

TABLE 4—AUTHORIZED CONTENTS IN KILOGRAMS (KG) AND CONDITIONS FOR SPECIFICATION 6L PACKAGES

Uranium-235		Plutonium [1]		Fissile class II transport index	Fissile class III maximum number of packages per transport vehicle
$H/X \leq 3$ [2]	$3 < H/X \leq 10$	$H/X \leq 10$	$10 < H/X \leq 20$		
14	[3] 3.6	——	——	1.3	80
——	——	2.5	2.4	1.8	50

[1] Plutonium solutions are not authorized.

[2] H/X is the ratio of hydrogen to fissile atoms in the inner containment with all sources of hydrogen in the containment considered.

[3] Volume not to exceed 3.6 liters.

(2) DOT Specification 6M (§ 178.104 of this subchapter), metal packaging. Authorized only for solid radioactive materials that will not decompose at temperatures up to 121°C(250°F). Radioactive decay heat output may not exceed 10 watts. Radioactive materials in other than special form shall be packaged in one or more tightly sealed metal cans or polyethylene bottles within a DOT Specification 2R (§ 178.34 of this subchapter) containment vessel. For fissile materials:

(i) Fissile Class I packages are limited to the following amounts of fissile radioactive materials: 1.6 kilograms of uranium-235; 0.9 kilograms of plutonium (except that due to the 10-watt thermal decay heat limitation, the limit for plutonium-238 is 0.02 kilograms); and 0.5 kilograms of uranium-233. The maximum ratio of hydrogen to fissile material must not exceed three, including all of the sources of hydrogen within the DOT Specification 2R containment vessel.

(ii) Maximum quantities of fissile material for Fissile Class II and Fissile Class III, and other restrictions are given in Table 5. For a Fissile Class II package, the minimum transport index to be assigned is shown in Table 5 and for a Fissile Class III shipment, the allowable number of similar packages per conveyance and per transport vehicle is shown. Each Fissile Class III shipment is also subject to the requirements in § 173.457. Where a maximum ratio of hydrogen to fissile material is specified in Table 5, only the hydrogen interspersed with the fissile material need be considered. For a uranium-233 shipment, the maximum inside diameter of the inner containment vessel must not exceed 12.1 centimeters (4.75 inches). Where necessary, a tight fitting steel insert shall be used to reduce a larger diameter inner containment vessel specified in § 178.104-3(b) of this subchapter to the 12 centimeter (4.75 inch) limit.

TABLE 5—AUTHORIZED CONTENTS FOR SPECIFICATION 6M PACKAGES[1]

Uranium-233[5]			Uranium-235[4] [7]			Plutonium[2] [3] [4]			Fissile class II transport index	Fissile class III maximum number of packages per transport vehicle
Metal or alloy	Compounds		Metal or alloy	Compounds		Metal or alloy	Compounds			
[8] H/X=0	H/X=0	H/X≤3	H/X=0	H/X=0	H/X≤3	H/X=0	H/X=0	H/X≤3		
3.6	4.4	2.9	7.2	7.6	5.3	3.1	4.1	3.4	0.1	1,250
[6] 4.2	5.2	3.5	8.7	9.6	6.4	3.4	4.5	4.1	0.2	625
[6] 5.2	6.8	4.5	11.2	13.9	8.3	4.2		4.5	0.5	250
			13.5	16.0	10.1	4.5			1.0	125
				26.0	16.1				5.0	25
				32.0	19.5				10.0	12

[1] Quantity in kilograms.

[2] Minimum percentage of plutonium-240 is 5 weight perent.

[3] 4.5 kilogram limitation of plutonium due to 10 watt decay heat limitation.

[4] For a mixture of uranium-235 and plutonium an equal amount of uranium-235 may be substituted for any portion of plutonium authorized.

[5] Maximum inside diameter of Specification 2R containment vessel not to exceed 12 centimeter (4.75 inch) (see par. (b)(2)(ii) of this section).

[6] Granulated or powdered metal with any particle less than 6 millimeter (0.25 inch) in the smallest dimension is not authorized.

[7] Maximum permitted uranium-235 enrichment is 93.5 percent.

[8] H/X is the ratio of hydrogen to fissile atoms in the inner containment with all sources of hydrogen in the containment considered.

(3) Type B, or Type B(U) or B(M) packaging that meets the standards for packaging of fissile materials in 10 CFR Part 71, and is approved by the U.S. Nuclear Regulatory Commission in accordance with § 173.471.

(4) Type B(U) or B(M) packaging that meets the applicable requirements for fissile radioactive materials in Section VI of the IAEA "Regulations for the Safe Transport of Radioactive Materials, Safety Series No. 6, 1973 Revised Edition (as amended)" and for which the foreign competent authority certificate has been revalidated by the Director, OHMT in accordance with § 173.472. Authorized only for import and export shipments.

(5) DOT Specification 20PF-1, 20PF-2, or 20PF-3 (§ 178.120 of this subchapter) or Specification 21PF-1 or 21PF-2 (§ 178.121 of this subchapter) phenolic-foam insulated protective overpacks, with snugfitting inner metal cylinders meeting all of the applicable requirements of §§ 173.24, 173.411, and 173.412. Handling procedures and packaging criteria shall be in accordance with U.S. Department of Energy Report No. ORO-651 or ANSI Standard N-14.1-1971. Quantities of uranium hexafluoride are authorized as shown in Table 6, with each package to be shipped as Fissile Class II, and assigned a minimum transport index as also shown:

TABLE 6—AUTHORIZED QUANTITIES OF URANIUM HEXAFLUORIDE (UF_6) AS FISSILE CLASS II

Protective overpack specification number	Maximum inner cylinder diameter		Maximum weight of UF_6 contents		Maximum U-235 enrichment (weight percent)	Fissile Class II transport index
	Centimeter	Inch	Kilograms	Pounds		
20PF-1	12.7	5	25	55	100.0	0.1
20PF-2	20.3	8	116	255	12.5	4.0
20PF-3	30.5	12	209	460	5.0	1.1
21PF-1[1]	[2] 76	[2] 30	2,247	4,950	5.0	5.0
	[3] 76	[3] 30	2,279	5,020	5.0	5.0
21PF-2[1]	[2] 76	[2] 30	2,247	4,950	5.0	5.0
	[3] 76	[3] 30	2,279	5,020	5.0	5.0

[1] For 76 centimeter cylinders, the maximum permited H/U atomic ratio is 0.088.

[2] Model 30A inner cylinder (Reference: ORO-651).

[3] Model 30B inner cylinder (Reference ORO-651)

[Amdt. 173-162, 48 FR 10226, Mar. 10, 1983, as amended at 48 FR 13432, Mar. 31, 1983; 48 FR 31218, July 7, 1983; Amdt. 173-185, 50 FR 11055, Mar. 19, 1985]

§ 173.418 Authorized packaging-pyrophoric radioactive materials.

(a) Pyrophoric radioactive materials, as referenced in § 172.101 of this subchapter, in quantities not exceeding A_2 per package shall be packaged in Type A packagings which are constructed of materials which will not react nor be decomposed by the contents. Contents must be:

(1) In solid form and must not be fissile unless excepted by § 173.453;

(2) Contained in sealed and corrosion resistant receptacles with positive closures (friction or slip-fit covers or stoppers are not authorized);

(3) Free of water and any contaminants which would increase the reactivity of the material; and

(4) Made inert to prevent self-ignition during transport by either:

(i) Mixing with large volumes of inerting materials such as graphite or dry sand, or other suitable inerting material, or blended into a matrix of hardened concrete; or

(ii) By filling the innermost receptacle with an appropriate inert gas.

(b) In addition to the applicable requirements of § 173.24 each package must be capable of passing the test conditions of § 173.465 without leakage of contents.

§ 173.419 Authorized packaging-oxidizing radioactive materials.

Certain oxidizing radioactive materials, as referenced in § 172.101 of this subchapter, and which are not fissile materials and not in quantities exceeding A_2, shall be packed in suitable inside packagings of glass, metal or compatible plastic and suitably cushioned with a material which will not react with the contents. Inner packaging and cushioning shall be enclosed within an outside packaging of wood, metal, or plastic. The package shall be capable of meeting the applicable test requirements of § 173.465 without leakage of contents. For shipment by air, the maximum quantity in any package may not exceed 11.3 kilograms (25 pounds).

§ 173.421 Limited quantities of radioactive materials.

Radioactive materials whose activity per package does not exceed the limits specified in § 173.423 are excepted from the specification packaging, shipping paper and certification, marking, and labeling requirements of this subchapter and requirements of this subpart if:

(a) The materials are packaged in strong, tight packages that will not leak any of the radioactive materials during conditions normally incident to transportation;

(b) The radiation level at any point on the external surface of the package does not exceed 0.5 millirem per hour;

(c) The nonfixed (removable) radioactive surface contamination on the external surface of the package does not exceed the limits specified in § 173.443(a);

(d) The outside of the inner packaging or if there is no inner packaging, the outside of the packaging itself bears the marking "Radioactive";

(e) Except as provided in § 173.424, the package does not contain more than 15 grams of uranium-235; and

(f) The material is otherwise prepared for shipment as specified in § 173.421-1.

[Amdt. 173-162, 48 FR 10226, Mar. 10, 1983, as amended by Amdt. 173-167, 48 FR 30137, June 30, 1983]

§ 173.421-1 Additional requirements for limited quantities of radioactive materials and radioactive instruments and articles.

(a) A limited quantity radioactive material or radioactive material instrument or article prepared for shipment under the provisions of § 173.421, § 173.422, or § 173.424 must be certified as being acceptable for transportation by having a notice enclosed in or on the package, included with the packing list, or otherwise forwarded with the package. This notice must include the name of the consignor or consignee and the statement "This

package conforms to the conditions and limitations specified in 49 CFR 173.421 for excepted radioactive material, limited quantity, n.o.s., UN2910; 49 CFR 173.422 for excepted radioactive material, instruments *and* articles, UN2911; or 49 CFR 173.424 for excepted radioactive material, articles manufactured from natural *or* depleted uranium *or* natural thorium, UN2909", as appropriate.

(b) A limited quantity radioactive material classed radioactive material and prepared for shipment under provisions of § 173.421, § 173.422, § 173.424 or § 173.421-2 is not subject to the requirements of this subchapter, except for:

(1) Sections 171.15, 171.16, 174.750, 176.710 and 177.861 of this subchapter pertaining to the reporting of incidents and decontamination when transported by a mode other than air; or

(2) Sections 171.15, 171.16, 175.45, and 175.700(b) of this subchapter pertaining to the reporting of incidents and decontamination if transported by aircraft. After May 2, 1987, it is also necessary to comply with §§ 173.448(f) and 175.700(c) of this subchapter.

(Approved by the Office of Management and Budget under control number 2137-0039)

[Amdt. 173-167, 48 FR 30137, June 30, 1983, as amended by Amdt. 173-187, 50 FR 18667, May 2, 1985]

§ 173.421-2 Requirements for multiple hazard limited quantity radioactive materials.

(a) Except as provided in paragraph (b) of this section or in § 173.4 of this subchapter, when a limited quantity radioactive material meets the definition of another hazard class, it shall be:

(1) Classed for the additional hazard;

(2) Packaged to conform with requirements specified in § 173.421(a) through (e) or § 173.422(a) through (g), as appropriate; and

(3) Offered for transportation in accordance with requirements applicable to the hazard for which it is classed.

(b) When a limited quantity radioactive material meets the definition of an ORM-A, B, or C, or is a combustible liquid in a packaging having a rated capacity of 110 gallons or less, it shall be:

(1) Classed radioactive material if:

(i) The material is not a hazardous waste or hazardous substance; and

(ii) The material is offered for transportation in a mode to which requirements of this subchapter pertaining to the specific material and hazard class do not apply;

(2) Classed combustible liquid or ORM-A, B, or C, as appropriate, if:

(i) The material is a hazardous waste or hazardous substance; or

(ii) The material is offered for transportation in a mode to which requirements of this subchapter pertaining to the specific material and hazard class do apply;

(3) Packaged to conform with requirements specified in §§173.421(a) through (e) or 173.422(a) through (g), as appropriate; and

(4) Offered for transportation in accordance with requirements applicable to the hazard for which it is classed.

(c) A limited quantity radioactive material which is classed other than radioactive material under provisions of paragraphs (a) or (b) of this section is excepted from requirements of §§ 173.421-1(a), 172.203(d), and 172.204(c)(4) of this subchapter if the entry "Limited quantity radioactive material" appears on the shipping paper in association with the basic description.

(d) After May 2, 1987, a limited quantity radioactive material classed other than radioactive material may not be offered for transportation aboard a passenger-carrying aircraft unless that material is intended for use in, or incident to, research, medical diagnosis or treatment.

[Amdt. 173-167, 48 FR 30138, June 30, 1983, as amended by Amdt. 173-187, 50 FR 18668, May 2, 1985]

§ 173.422 Exceptions for instruments and articles.

Instruments and manufactured articles (including clocks, electronic tubes or apparatus) or similar devices having radioactive materials in gaseous or non-dispersible solid form as a component part are excepted from the specification packaging, shipping paper and certification, marking and labeling requirements of this subchapter and requirements of this subpart, if:

(a) The activity of the instrument or article does not exceed the relevant limit listed in Table 7 in § 173.423;

(b) The total activity per package does not exceed the relevant limit listed in Table 7 in § 173.423;

(c) The radiation level at 10 centimeters (4 inches) from any point on the external surface of any unpackaged instrument or article does not exceed 10 millirem per hour;

(d) The radiation level at any point on the external surface of a package bearing the article or instrument does not exceed 0.5 millirem per hour, or, for exclusive use domestic shipments, 2 millirem per hour;

(e) The nonfixed (removable) radioactive surface contamination on the external surface of the package does not exceed the limits specified in § 173.443(a);

(f) Except as provided in § 173.424, the package does not contain more than 15 grams of uranium 235; and

(g) [Reserved]

(h) The instrument or article is otherwise prepared for shipment as specified in § 173.421-1.

[Amdt. 173-162, 48 FR 10226, Mar. 10, 1983, as amended by Amdt. 173-167, 48 FR 30138, June 30, 1983; Amdt. 173-162, 48 FR 31218, July 7, 1983; Amdt. 173-16, 48 FR 50460, Nov. 1, 1983]

§ 173.423 Table of activity limits—excepted quantities and articles.

The limits applicable to instruments, articles, and limited quantities subject to exceptions under §§ 173.421 and 173.422 are shown in Table 7:

TABLE 7—ACTIVITY LIMITS FOR LIMITED QUANTITIES, INSTRUMENTS, AND ARTICLES

Nature of contents	Instruments and articles		Materials package limits
	Instrument and article limits [1]	Package limits	
Solids:			
Special form	$10^{-2}A_1$	A_1	$10^{-3}A_1$
Other forms	$10^{-2}A_2$	A_2	$10^{-3}A_2$
Liquids:			
Tritiated water:			
<0.1 Ci/liter			1000 Curies
0.1 Ci to 1.0 Ci/1			100 Curies
>1.0 Ci/liter			1 Curie
Other liquids	$10^{-3}A_2$	$10^{-1}A_2$	$10^{-4}A_2$
Gases:			
Tritium [2]	20 Curies	200 Curies	20 Curies
Special form	$10^{-3}A_1$	$10^{-2}A_1$	$10^{-3}A_1$
Other forms	$10^{-3}A_2$	$10^{-2}A_2$	$10^{-3}A_2$

[1] For mixture of radionuclides see § 173.433(b).

[2] These values also apply to tritium in activated luminous paint and tritium adsorbed on solid carriers.

[Amdt. 173-162, 48 FR 10226, Mar. 10, 1983, as amended at 48 FR 13432, Mar. 31, 1983; 48 FR 31218, July 7, 1983]

§ 173.424 Excepted articles containing natural uranium or thorium.

Manufactured articles in which the sole radioactive material content is natural or depleted uranium or natural thorium are excepted from the specification packaging, shipping paper and certification, marking and labeling requirements of this subchapter and requirements of this subpart if:

(a) The outer surface of the uranium or thorium is enclosed in an inactive sheath made of metal or other durable protective material;

(b) The conditions specified in § 173.421 (b), (c), and (d) are met; and

(c) The article is otherwise prepared for shipment as specified in § 173.421-1.

[Amdt. 173-162, 48 FR 10226, Mar. 10, 1983, as amended by Amdt. 173-167, 48 FR 30138, June 30, 1983; Amdt. 173-162, 48 FR 31218, July 7, 1983]

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§ 173.425 Transport requirements for low specific activity (LSA) radioactive materials.

In addition to other applicable requirements specified in this subchapter, low specific activity (LSA) materials shall be transported in accordance with paragraph (a) of this section, or if transported as exclusive-use may be transported in accordance with paragraph (b) or (c) of this section.

(a) DOT Specification 7A (§ 178.350 of this subchapter) Type A package. The requirements of § 173.412 (a), (b), (d), and (n) do not apply.

(b) Packaged shipments of LSA material consigned as exclusive use shall either be in accordance with paragraph (a) of this section or shall comply with the following in which case they are excepted from specification packaging, marking and labeling:

(1) Materials must be packaged in strong, tight packages so that there will be no leakage of radioactive material under conditions normally incident to transportation.

(2) Packages must not have any significant removable surface contamination (see § 173.443).

(3) External radiation levels must comply with § 173.441.

(4) Shipments must be loaded by consignor and unloaded by consignee from the conveyance or freight contained in which originally loaded.

(5) There must be no loose radioactive material in the conveyance.

(6) Shipment must be braced so as to prevent shifting of lading under conditions normally incident to transportation.

(7) Except for shipments of unconcentrated uranium or thorium ores, the transport vehicle must be placarded with the placards prescribed in accordance with Subpart F of Part 172 of this subchapter, as appropriate.

(8) The exterior of each outside package must be stenciled or otherwise marked "Radioactive—LSA".

(9) Specific instructions for maintenance of exclusive use shipment controls must be provided by the shipper to the carrier. Such instructions must be included with the shipping paper information.

(10) Transportation by aircraft is prohibited.

(c) Unpackaged (bulk) shipments of LSA materials shall be transported only in exclusive use closed transport vehicles and shall comply with the following:

(1) Authorized materials are limited to the following:

(i) Uranium or thorium ores and physical or chemical concentrates of those ores.

(ii) Uranium metal or natural thorium metal, or alloys of these materials.

(iii) Materials of low radioactive concentration, if the average estimated radioactivity concentration does not exceed 0.001 millicurie per gram and the contribution from materials with an A_2 value (see § 173.435) of less than 0.05 curie does not exceed one percent of the total radioactivity.

(iv) Objects of nonradioactive material externally contaminated with radioactive material, if the radioactive material is not readily dispersible and the surface contamination, when averaged over one square meter, does not exceed 0.0001 millicurie per square centimeter of radionuclides for which the A_2 value is less than 0.05 or 0.001 millicurie per square centimeter of other radionuclides. Such objects must be suitably wrapped or enclosed.

(2) Bulk liquids must be transported in the following: (i) Specification 103CW, 111A60W7 (§§ 179.200, 179.201, 179.202 of this subchapter) tank cars. Bottom openings in tanks prohibited.

(ii) Specification MC 310, MC 311, MC 312, or MC 331 (§ 178.343 or § 178.337 of this subchapter) cargo tanks. Authorized only where the radioactivity concentration does not exceed 10 percent of the specified low specific activity levels (see § 173.403(n)). The requirements of § 173.412(n) do not apply to these cargo tanks. Bottom fittings and valves are not authorized. Trailer-on-flat-car service is not authorized.

(3) External radiation levels must comply with § 173.441(b).

(4) Shipments must be loaded by the consignor, and unloaded by the consignee from the conveyance or freight container in which originally loaded.

(5) Except for shipments of unconcentrated uranium or thorium ores, the transport vehicle must be placard-

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ed with the placards prescribed in Subpart F of Part 172 of this subchapter, as appropriate.

(6) There must be no leakage of radioactive materials from the vehicle.

(7) Specific instructions for maintenance of exclusive use shipment controls must be provided by the shipper to the carrier. Such instructions must be included with the shipping paper information.

(8) Transportation by aircraft is prohibited.

(d) Except for transportation by aircraft, low specific activity material that conforms with the provisions specified in 10 CFR 20.306 is excepted from all requirements of this subchapter pertaining to radio-active materials when offered for transportation for disposal or recovery. A material which meets the definition of another hazard class is subject to the provisions of this subchapter relating to that hazard class.

(The information collection requirements contained in paragraph (b)(9) were approved by the Office of Management and Budget under control number 2137-0536. The information collection requirements contained in paragraph (c)(7) were approved by the Office of Management and Budget under control number 2137-0534)

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 173-162, 48 FR 10226, Mar. 10, 1983, as amended by Amdt. 173-162, 48 FR 31218, July 7, 1983; Amdt. 173-178, 49 FR 38134, Sept. 27, 1984; Amdt. 173-188, 50 FR 23813, June 6, 1985]

§ 173.427 Empty radioactive materials packaging.

Any packaging which previously contained radioactive materials and has been emptied of contents as far as practical, is excepted from marking and labeling requirements of this subchapter and from requirements of this subpart, provided that:

(a) It complies with the requirements of § 173.421(b), (c) and (e);

(b) The packaging is in unimpaired condition and is securely closed so that there will be no leakage of radioactive material under conditions normally incident to transportation;

(c) Internal contamination does not exceed 100 times the limits specified in § 173.443(a); and

(d) Any labels previously applied in conformance with Subpart E of Part 172 of this subchapter are removed, obliterated or covered and the "Empty" label prescribed in § 172.450 is affixed to the packaging.

[Amdt. 173-162, 48 FR 10226, Mar. 10, 1983, as amended at 48 FR 31218, July 7, 1983; Amdt. 173-16, 48 FR 50460, Nov. 1, 1983]

§ 173.431 Activity limits for Type A and Type B packages.

(a) A Type A package shall not contain a quantity of radioactivity greater than A_1 (for special form radioactive material) or A_2 (for normal form radioactive material) as listed in § 173.435, or for radioactive materials not listed in § 173.435, as determined in accordance with § 173.433.

(b) The limits on activity contained in a Type B, Type B(U), or Type B(M) package are those prescribed in § 173.416 or in the applicable approval certificate under § 173.471 or § 173.473.

[Amdt. 173-162, 48 FR 31218, July 7, 1983]

§ 173.433 Requirements for determination of A_1 and A_2 values for radionuclides.

(a) *Single radionuclides.* (1) For single radionuclides of known identity, the values of A_1 and A_2 are those given in the table in § 173.435. The values of A_1 and A_2 are also applicable for radionuclides contained in (α,n) or (γ,n) neutron sources.

(2) For any single radionuclide of known identity, which is not listed in § 173.435, the values of A_1 and A_2 shall be determined in accordance with the following:

(i) If the radionuclide emits only one type of radiation, A_1 is determined in accordance with paragraphs (a)(2)(i) (A), (B), (C), and (D) of this section. For radionuclides emitting different kinds of radiation, A_1 is the most restrictive value of those determined for each kind of radiation. However, in both cases, A_1 is restricted to a maximum of 1000 curies. If a parent nuclide decays into a shorter lived daughter, of a half-life not greater than 10 days, A_1 is calculated for both the parent and the daughter, and the more limiting of the two values is assigned to the parent nuclide.

(A) For gamma emitters, A_1 is determined by the expression: $A_1 = 9/\Gamma$ curie

where Γ is the gamma-ray constant, corresponding to the dose in roentgens per hour at 1 meter per curie; the number 9 results from the choice of 1 rem per hour at a distance of 3 meters as the reference dose-equivalent rate.

(B) For x-ray emitters, A_1 is determined by the atomic number (Z) of the nuclide:

$Z \leq 55$ $A_1 = 1000$ curies
for $Z > 55$ $A_1 = 200$ curies

(C) For beta emitters, A_1 is determined by the maximum beta energy (E_{max}) according to Table 8:

TABLE 8—A_1 FOR BETA EMITTERS

E_{max} (MeV)	A_1 (curies)
<0.5	1000
$0.5-<1.0$	300
$1.0-<1.5$	100
$1.5-<2.0$	30
≥ 2.0	10

(D) For alpha emitters, A_1 is determined by the expression:

$A_1 = 1000\ A_2$

where A_2 is the value listed in Table 9:

TABLE 9—A_2 VALUES

	A_2		
Atomic number	Half-life less than 1,000 days	Half-life 1,000 days to 10^6 years	Half-life greater than 10^6 years
1 to 81	3 curies	50 millicuries	3 curies
82 and above	2 millicuries	2 millicuries	3 curies

(ii) For assignment of A_2 values, A_2 is the more restrictive of the following values:

(A) The corresponding A_1.

(B) The value A_2 obtained from Table 9.

(3) For any single radionuclide whose identity is unknown, the value of A_1 is 2 curies and the value of A_2 is 0.002 curies. However, if the atomic number of the radionuclide is less than 82, the value of A_1 is 10 curies and the value of A_2 is 0.4 curies.

(b) *Mixture of radionuclides, including radioactive decay chains.* (1) For mixed fission products, where a detailed analysis of the mixture is not carried out, the following activity limits apply:

(i) $A_1 = 10$ curies.

(ii) $A_2 = 0.4$ curies.

(2) A single radioactive decay chain is considered to be a single radionuclide when the radionuclides are present in their naturally occurring portions and no daughter nuclide has a half-life either longer than 10 days or longer than that of the parent nuclide. The activity to be taken into account and the A_1 or A_2 value to be applied are those corresponding to the parent nuclide of that chain. When calculating A_1 or A_2 values, radiation emitted by daughters must be taken into account. However, in the case of radioactive decay chains in which any daughter nuclide has a half-life either longer than 10 days or greater than that of the parent nuclide, the parent and daughter nuclides are considered to be mixtures of different nuclides.

(3) In the case of a mixture of different radionuclides, where the identity and activity of each radionuclide is known, the permissible activity of each radionuclide $R_1, R_2, \ldots R_n$ must be such that $F_1 + F_2 + \ldots F_n$ is not greater than unity, when—

$$F_1 = \frac{\text{Total activity of } R_1}{A_i(R_1)}$$

$$F_2 = \frac{\text{Total activity of } R_2}{A_i(R_2)}$$

$$F_n = \frac{\text{Total activity of } R_n}{A_i(R_n)}$$

Where A_i $(R_1, R_2 \ldots R_n)$ is the value of A_1 or A_2 as appropriate for the nuclide $R_1, R_2 \ldots R_n$.

(4) When the identity of each radionuclide is known but the individual activities of some of the radionuclides are not known, the formula given in subparagraph (3) of this paragraph must be applied to establish the values

of A_1 or A_2 as appropriate. All the radionuclides whose individual activities are not kmown (but whose total activity is known) must be classed in a single group and the most restrictive value of A_1 or A_2 applicable to any one of them shall be used as the value of A_1 and A_2 in the denominator of the fraction.

(5) When the identity of each radionuclide is known but the individual activity of the radionuclides is not known, the most restrictive value of A_1 or A_2 applicable to any one of the radionuclides present is the applicable value.

(6) When the identity of the radionuclides is not known, the value of A_1 is 2 curies and the value of A_2 is 0.002 curies. However, if alpha emitters are known to be absent, the value of A_2 is 0.4 curies.

[Amdt. 173-162, 48 FR 10226, Mar. 10, 1983; 48 FR 13432, Mar. 31, 1983, as amended at 48 FR 31218, July 7, 1983; Amdt. 173-185, 50 FR 11055, Mar. 19, 1985]

§ 173.434 Activity-mass relationships for uranium and natural thorium.[1]

Radioactive material	Curies per gram	Grams per curie
Uranium—(Wt% ^{235}U present):		
0.45	5.0×10^{-7}	2.0×10^{6}
0.72 (natural)	7.06×10^{-7}	1.42×10^{6}
1.0	7.6×10^{-7}	1.3×10^{6}
1.5	1.0×10^{-6}	1.0×10^{6}
5.0	2.7×10^{-6}	3.7×10^{5}
10.0	4.8×10^{-6}	2.1×10^{5}
20.0	1.0×10^{-5}	1.0×10^{5}
35.0	2.0×10^{-5}	5.0×10^{4}
50.0	2.5×10^{-5}	4.0×10^{4}
90.0	5.8×10^{-5}	1.7×10^{4}
93.0	7.0×10^{-5}	1.4×10^{4}
95.0	9.1×10^{-5}	1.1×10^{4}
Natural thorium	2.2×10^{-7}	4.6×10^{6}

[1] The figures for uranium include representative values for the activity of uranium-234 which is concentrated during the enrichment process. The activity for thorium includes the equilibrium concentration of thorium-228.

§ 173.435 Table of A_1 and A_2 values for radionuclides.

Symbol of radionuclide	Element and atomic number	$A_1(C_i)$ special form	$A_2(C_i)$ normal form
227_{Ac}	Actinium (89).	1000	0.003
228_{Ac}		10	4
105_{Ag}	Silver (47)	40	40
$110m_{Ag}$		7	7
111_{Ag}		100	20
241_{Am}	Americium (95)[1].	8	0.008
243_{Am}		8	0.008
37_{Ar} (compressed or uncompressed).	Argon (18)	1000	1000
41_{Ar} (uncompressed).		20	20
41_{Ar} (compressed).		1	1
73_{As}	Arsenic (33)	1000	400
74_{As}		20	20
76_{As}		10	10
77_{As}		300	20
211_{At}	Astatine (85).	200	7
193_{Au}	Gold (79)	200	200
196_{Au}		30	30
198_{Au}		40	20
199_{Au}		200	25
131_{Ba}	Barium (56)	40	40
133_{Ba}		40	10
140_{Ba}		20	20
7_{Be}	Beryllium (4).	300	300
206_{Bi}	Bismuth (83).	5	5
207_{Bi}		10	10
$210_{Bi\ (RaE)}$		100	4
212_{Bi}		6	6
249_{Bk}	Berkelium (97).	1000	1
77_{Br}	Bromine (35)	70	25
82_{Br}		6	6
11_{C}	Carbon (6)	20	20
14_{C}		1000	60
45_{Ca}	Calcium (20)	1000	25
47_{Ca}		20	20
109_{Cd}	Cadmium (48).	1000	70
$115m_{Cd}$		30	30
115_{Cd}		80	20
139_{Ce}	Cerium (58).	100	100
141_{Ce}		300	25
143_{Ce}		60	20
144_{Ce}		10	7
249_{Cf}	Californium (98).	2	0.002
250_{Cf}		7	0.007
252_{Cf}		2	0.009
36_{Cl}	Chlorine (17)	300	10
38_{Cl}		10	10
242_{Cm}	Curium (96)	200	0.2
243_{Cm}		9	0.009

Symbol of radionuclide	Element and atomic number	$A_1(C_i)$ special form	$A_2(C_i)$ normal form
244_{Cm}		10	0.01
245_{Cm}		6	0.006
246_{Cm}		6	0.006
56_{Co}	Cobalt (27)	5	5
57_{Co}		90	90
$58m_{Co}$		1000	1000
58_{Co}		20	20
60_{Co}		7	7
51_{Cr}	Chromium (24).	600	600
129_{Cs}	Cesium (55)	40	40
131_{Cs}		1000	1000
$134m_{Cs}$		1000	10
134_{Cs}		10	10
135_{Cs}		1000	25
136_{Cs}		7	7
137_{Cs}		30	10
64_{Cu}	Copper (29)	80	25
67_{Cu}		200	25
165_{Dy}	Dysprosium (66).	100	20
166_{Dy}		1000	200
169_{Er}	Erbium (68)	1000	25
171_{Er}		50	20
$152m_{Eu}$	Europium (63).	30	30
152_{Eu}		20	10
154_{Eu}		10	5
155_{Eu}		400	60
18_{F}	Flourine (9)	20	20
52_{Fe}	Iron (26)	5	5
55_{Fe}		1000	1000
59_{Fe}		10	10
67_{Ga}	Gallium (31)	100	100
68_{Ga}		20	20
72_{Ga}		7	7
153_{Gd}	Gadolinium (64).	200	100
159_{Gd}		300	20
68_{Ge}	Germanium (32).	20	10
71_{Ge}		1000	1000
3_{H}	Hydrogen (1) See T-Tritium.		
181_{Hf}	Hafnium (72).	30	25
$197m_{Hg}$	Mercury (80).	200	200
197_{Hg}		200	200
203_{Hg}		80	25
166_{Ho}	Holmium (67).	30	30
123_{I}	Iodine (53)	50	50
125_{I}		1000	70
126_{I}		40	10
129_{I}		1000	2
131_{I}		40	10
132_{I}		7	7
133_{I}		30	10
134_{I}		8	8
135_{I}		10	10
111_{In}	Indium (49)	30	25
$113m_{In}$		60	60
$114m_{In}$		30	20
$115m_{In}$		100	20
190_{Ir}	Indium (77)	10	10
192_{Ir}		20	10
194_{Ir}		10	10
42_{K}	Potassium (19).	10	10
43_{K}		20	10
$85m_{Kr}$ (uncompressed).	Krypton (36)	100	100
$85m_{Kr}$ (compressed).		3	3
85_{Kr} (uncompressed).		1000	1000
85_{Kr} (compressed).		5	5
87_{Kr} (uncompressed).		20	20
87_{Kr} (compressed).		0.6	0.6
140_{La}	Lanthanum (57).	30	30
LSA	Low specific activity material—see § 173.403.		
177_{Lu}	Lutetium (71).	300	25
MFP	Mixed fission products.	10	0.4
28_{Mg}	Magnesium (12).	5	6
52_{Mn}	Manganese (25).	5	5
54_{Mn}		20	20
56_{Mn}		5	5
99_{Mo}	Molybdenum (42).	100	20
13_{N}	Nitrogen (7)	20	10
22_{Na}	Sodium (11)	8	8
24_{Na}		5	5
$93m_{Nb}$	Niobium (41).	1000	200
95_{Nb}		20	20
97_{Nb}		20	20
147_{Nd}	Neodymium (60).	100	20
149_{Nd}		30	20
59_{Ni}	Nickel (28)	1000	900
63_{Ni}		1000	100
65_{Ni}		10	10
237_{Np}	Neptunium (93).	5	0.005
239_{Np}		200	25
185_{Os}	Osmium (76).	20	20
191_{Os}		600	200
191_{mOs}		200	200
193_{Os}		100	20
32_{P}	Phosphorus (15).	30	30
230_{Pa}	Protactinium (91).	20	0.8
231_{Pa}		2	0.002
233_{Pa}		100	100
201_{Pb}	Lead (82)	20	20
210_{Pb}		100	0.2
212_{Pb}		6	5
103_{Pd}	Palladium, (46).	1000	700

Symbol of radionuclide	Element and atomic number	$A_1(C_i)$ special form	$A_2(C_i)$ normal form
109_{Pd}		100	20
147_{Pm}	Promethium (61).	1000	25
149_{Pm}		100	20
210_{Po}	Polonium (84).	200	0.2
142_{Pr}	Praseodymium (59).	10	10
143_{Pr}		300	20
191_{Pt}	Platinum (78).	100	100
$193m_{Pt}$		200	200
$197m_{Pt}$		300	20
197_{Pt}		300	20
238_{Pu}	Plutonium (94)[1]	3	0.003
239_{Pu}		2	0.002
240_{Pu}		2	0.002
241_{Pu}		1000	0.1
242_{Pu}		3	0.003
223_{Ra}	Radium (88)	50	0.2
224_{Ra}		6	0.5
226_{Ra}		10	0.05
228_{Ra}		10	0.05
81_{Rb}	Rubidium (37).	30	25
86_{Rb}		30	30
87_{Rb}		Unlimited	Unlimited
Rb (natural)		Unlimited	Unlimited
186_{Re}	Rhenium (75).	100	20
187_{Re}		Unlimited	Unlimited
188_{Re}		10	10
Re (natural)		Unlimited	Unlimited
$103m_{Rh}$	Rhodium (45).	1000	1000
105_{Rh}		200	25
222_{Rn}	Radon (86)	10	2
97_{Ru}	Ruthenium (44).	80	80
103_{Ru}		30	25
105_{Ru}		20	20
106_{Ru}		10	7
35_{S}	Sulphur (16)	1000	60
122_{Sb}	Antimony (51).	30	30
124_{Sb}		5	5
125_{Sb}		40	25
46_{Sc}	Scandium (21).	8	8
47_{Sc}		200	20
48_{Sc}		5	5
75_{Se}	Selenium (34).	40	40
31_{Si}	Silicon (14)	100	20
147_{Sm}	Samarium (62)	Unlimited	Unlimited
151_{Sm}		1000	90
153_{Sm}		300	20
113_{Sn}	Tin (50)	60	60
$119m_{Sn}$		100	100
125_{Sn}		10	10
$85m_{Sr}$	Strontium (38).	80	80
85_{Sr}		30	30
$87m_{Sr}$		50	50
89_{Sr}		100	10
90_{Sr}		10	0.4
91_{Sr}		10	10
92_{Sr}		10	10
T (uncompressed).	Tritium (1)	1000	1000
T (compressed).		1000	1000
T (activated luminous paint).		1000	1000
T (adsorbed on solid carrier).		1000	1000
T (tritiated water).		1000	1000
T (other forms).		20	20
182_{Ta}	Tantalum (73).	20	20
160_{Tb}	Terbium (65).	20	10
$96m_{Tc}$	Technetium (43).	1000	1000
96_{Tc}		6	6
$97m_{Tc}$		1000	200
97_{Tc}		1000	400
$99m_{Tc}$		100	100
99_{Tc}		1000	25
$125m_{Te}$	Tellurium (52).	1000	100
$127m_{Te}$		300	20
127_{Te}		300	20
$129m_{Te}$		30	10
129_{Te}		100	20
$131m_{Te}$		10	10
132_{Te}		7	7
227_{Th}	Thorium (90).	200	0.2
228_{Th}		6	0.008
230_{Th}		3	0.003
231_{Th}		1000	25
232_{Th}		Unlimited	Unlimited
234_{Th}		10	10
$_{Th}$ (natural)		Unlimited	Unlimited
$_{Th}$ (irradiated)[2].			
200_{Tl}	Thallium (81)	20	20
201_{Tl}		200	200
202_{Tl}		40	40
204_{Tl}		300	10
170_{Tm}	Thulium (69).	300	10
171_{Tm}		1000	100
230_{U}	Uranium (92).	100	0.1
232_{U}		30	0.03
233_{U}		100	0.1
234_{U}		100	0.1
235_{U}		100	0.2
236_{U}		200	0.2
238_{U}		Unlimited	Unlimited
$_{U}$ (natural).		Unlimited	Unlimited
$_{U}$ (enriched).			
< 20%		Unlimited	Unlimited
20% or greater.		100	0.1

Symbol of radionuclide	Element and atomic number	$A_1(C_i)$ special form	$A_2(C_i)$ normal form
U (depleted).		Unlimited	Unlimited
U (irradiated)[3].			
48_V	Vanadium (23).	6	6
181_W	Tungsten (74).	200	100
185_W		1000	25
187_W		40	20
127_{Xe} (uncompressed).	Xenon (54)	70	70
127_{Xe} (compressed).		5	5
$131m_{Xe}$ (compressed).		10	10
$131m_{Xe}$ (uncompressed).		100	100
133_{Xe} (uncompressed).		1000	1000
133_{Xe} (compressed).		5	5
135_{Xe} (uncompressed).		70	70
135_{Xe} (compressed).		2	2
87_Y	Yttrium (39)	20	20
90_Y		10	10
$91m_Y$		30	30
91_Y		30	30
92_Y		10	10
93_Y		10	10
169_{Yb}	Ytterbium (70).	80	80
175_{Yb}		400	25
65_{Zn}	Zinc (30)	30	30
$69m_{Zn}$		40	20
69_{Zn}		300	20
93_{Zr}	Zirconium (40)	1000	200
95_{Zr}		20	20
97_{Zr}		20	20

[1] For shipments solely within the United States the A_1 value is 20 curies for americium and plutonium contained in Am-Be or Pu-Be neutron sources or in nuclear-powered pacemakers.

[2] The values of A_1 and A_2 must be calculated in accordance with the orocedure specified in § 173.433 of this subchapter, taking into account the activity of the fission products and of the uranium-233 in addition to that of the thorium.

[3] The values of A_1 and A_2 must be calculated in accordance with the procedure specified in § 173.433 of this subchapter, taking into account the activity of the fission products and plutonium isotopes in addition to that of the uranium.

[Amdt. 173-162, 48 FR 10226, Mar. 10, 1983; 48 FR 13432, Mar. 31, 1983, as amended at 48 FR 31219, July 7, 1983]

§ 173.441 Radiation level limitations.

(a) Except as provided in paragraph (b) of this section, each package of radioactive materials offered for transportation shall be designed and prepared for shipment so that under conditions normally incident to transportation the radiation level does not exceed 200 millirem per hour at any point on the external surface of the package, and the transport index does not exceed 10.

(b) A package which exceeds the radiation level limits specified in paragraph (a) of this section shall be transported by exclusive use shipment only and the radiation levels for such shipment must not exceed the following during transportation:

(1) 200 millirem per hour (2 millisievert per hour) on the external surface of the package unless the following conditions are met, in which case the limit is 1000 millirem per hour (10 millisievert per hour).

(i) The shipment is made in a closed transport vehicle;

(ii) The package is secured within the vehicle so that its position remains fixed during transportation; and

(iii) There are no loading or unloading operations between the beginning and end of the transportation;

(2) 200 millirem per hour (2 millisievert per hour) at any point on the outer surfaces of the vehicle, including the top and underside of the vehicle; or in the case of a flat-bed style vehicle, at any point on the vertical planes projected from the outer edges of the vehicle, on the upper surface of the load (or enclosure is used), and on the lower external surface of the vehicle;

(3) 10 millirem per hour (0.1 millisievert per hour) at any point 2 meters (6.6 feet) from the outer lateral surfaces of the vehicle (excluding the top and underside of the vehicle); or in the case of a flat-bed style vehicle, at any point 2 meters (6.6 feet) from the ver-

tical planes projected by the outer edges of the vehicle (excluding the top and underside of the vehicle); and

(4) 2 millirem per hour (0.02 millisievert per hour) in any normally occupied space, except that this provision does not apply to private carriers if exposed personnel under their control wear radiation dosimetry devices and operate under provisions of a State or Federally regulated radiation protection program.

(c) For shipments made under the provisions of paragraph (b) of this section, the shipper shall provide specific written instructions for maintenance of the exclusive use shipment controls to the carrier. The instructions shall be included with the shipping paper information.

(d) Packages exceeding the radiation level or transport index prescribed in paragraph (a) of this section shall not be transported by aircraft.

(e) The written instructions required for exclusive use shipments must be sufficient so that, when followed, they will cause the carrier to avoid actions which will unnecessarily delay delivery or unnecessarily result in increased radiation levels or radiation exposures.

(The information collection requirements contained in paragraph (c) were approved by the Office of Management and Budget under control number 2137-0536)

[Amdt. 173-162, 48 FR 10226, Mar. 10, 1983, as amended at 48 FR 31219, July 7, 1983; Amdt. 173-193, 50 FR 41898, Oct. 16, 1985]

EFFECTIVE DATE NOTE: Section 173.441 was amended at 50 FR 41898, Oct. 16, 1985, by revising paragraph (b), effective December 1, 1985. For the convenience of the user, the superseded text is set forth below.

§ 173.441 **Radiation level limitations.**

* * * * *

(b) A shipment which exceeds the radiation level limits specified in paragraph (a) of this section, may be transported as an exclusive use shipment if the radiation level does not exceed any of the following at any time during transportation:

(1) 200 millirem per hour on the accessible external surface of the package unless the following conditions are met, in which case the limit is 1000 millirem per hour:

(i) The shipment is made in a closed transport vehicle;

(ii) Provisions are made to secure the package so that its position within the transport vehicle remains fixed during transportation; and

(iii) There are no loading or unloading operations between the beginning and end of the transportation;

(2) 200 millirem per hour at any point on the outer surface of the transport vehicle, including the upper and lower surfaces, or, in the case of an open transport vehicle, at any point on the vertical planes projected from the outer edges of the transport vehicle, on the upper surface of the load, and on the lower external surface of the transport vehicle;

(3) 10 millirem per hour at any point 2 meters (6.6 feet) from the vertical planes represented by the outer lateral surfaces of the transport vehicle, or, in the case of an open transport vehicle, at any point 2 meters from the vertical planes projected from the outer edges of the conveyance; and

(4) 2 millirem per hour in any normally occupied position in the car or transport vehicle, except that this provision does not apply to private motor carriers when the personnel are operating under a radiation protection program and wear radiation exposure monitoring devices.

* * * * *

§ 173.442 Thermal limitations.

Each package of radioactive material shall be designed, constructed, and loaded so that:

(a) The heat generated within the package because of the radioactive contents will not, at any time during transportation, affect the integrity of the package under conditions normally incident to transportation; and

(b) The temperature of the accessible external surfaces of the loaded package will not, assuming still air in the shade at an ambient temperature of 38° C (100° F), exceed either:

(1) 50°C (122°F) in other than an exclusive use shipment; or

(2) 82°C (180°F) in an exclusive use shipment.

§ 173.443 Contamination control.

(a) The level of non-fixed (removable) radioactive contamination on the external surfaces of each package offered for shipment shall be kept as low as practicable. The level of non-fixed radioactive contamination may be determined by wiping an area of 300

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square centimeters of the surface concerned with an absorbent material, using moderate pressure, and measuring the activity on the wiping material. Sufficient measurements shall be taken in the most appropriate locations to yield a representative assessment of the non-fixed contamination levels. Except as provided in paragraph (b) of this section, the amount of radioactivity measured on any single wiping material when averaged over the surface wiped shall not exceed the limits given in Table 10 at any time during transport. Other methods of assessment of equal or greater efficiency may be used. When other methods are used the detection efficiency of the method used shall be taken into account and in no case shall the non-fixed contamination on the external surfaces of the package exceed ten times the limits listed in Table 10.

TABLE 10—REMOVABLE EXTERNAL RADIOACTIVE CONTAMINATION—WIPE LIMITS

Contaminant	Maximum permissible limits	
	uCi/cm²	dpm/cm²
Beta-gamma emitting radionuclides, all radionuclides with half-lives less than ten days, natural uranium, natural thorium, uranium-235, uranium-238, thorium-232, thorium-228 and thorium-230 when contained in ores or physical concentrates	10^{-5}	22
All other alpha emitting radionuclides	10^{-6}	2.2

(b) Except as provided in paragraph (d) of this section, in the case of packages transported as exclusive use shipments by rail or public highway only, the removable (non-fixed) radioactive contamination on any package at any time during transport shall not exceed ten times the levels prescribed in paragraph (a) of this section. The levels at the beginning of transport shall not exceed the levels prescribed in paragraph (a) of this section.

(c) Except as provided in paragraph (d) of this section, each transport vehicle used for transporting radioactive materials as an exclusive use shipment which utilizes the provisions of paragraph (b) of this section shall be surveyed with appropriate radiation detection instruments after each use. A vehicle shall not be returned to service until the radiation dose rate at each accessible surface is 0.5 millirem per hour or less, and there is no significant removable (non-fixed) radioactive surface contamination as specified in paragraph (a) of this section.

(d) Paragraph (b) and (c) of this section do not apply to any closed transport vehicle used solely for the transportation by public highway of radioactive material packages with contamination levels that do not exceed 10 times the levels prescribed in paragraph (a) of this section if:

(1) A survey of the interior surfaces of the empty vehicle shows that the radiation dose rate at any point does not exceed 10 millirem per hour at the surface or 2 millirem per hour at 1 meter (3.3. feet) from the surface;

(2) Each vehicle is stenciled with the words "For Radioactive Materials Use Only" in letters at least 76 millimeters (3 inches) high in a conspicuous place on both sides of the exterior of the vehicle; and

(3) Each vehicle is kept closed except for loading or unloading.

[Amdt. 173-162, 48 FR 10226, Mar. 10, 1983, as amended at 48 FR 31219, July 7, 1983]

§ 173.444 Labeling requirements.

Each package of radioactive materials, unless excepted by § 173.421, § 173.422, § 173.424, § 173.425(b), or § 173.427 shall be labeled as provided in Subpart E of Part 172 of this subchapter.

§ 173.446 Placarding requirements.

See Subpart F of Part 172 of this subchapter.

§ 173.447 Storage incident to transportation—general requirements.

The following requirements apply to temporary storage during the course of transportation but not to Nuclear Regulatory Commission or Agreement State licensed facilities or U.S. Government owned or contracted facilities.

(a) The number of packages bearing Radioactive Yellow II or Radioactive Yellow III labels stored in any one storage area, such as a transit area, terminal building, store-room, or assembly yard, shall be limited so that the sum of the transport indexes in any individual group of packages does not exceed 50. Groups of these packages must be stored so as to maintain a spacing of at least 6 meters (20 feet) from other groups of packages containing radioactive materials.

(b) Mixing of different kinds of packages, including Fissile Class I packages with Fissile Class II packages, is authorized in accordance with § 173.459 of this subchapter.

§ 173.448 General transportation requirements.

(a) Each shipment of radioactive materials shall be secured in order to prevent shifting during normal transportation conditions.

(b) Except as may be specifically required by the competent authority in the applicable certificate, a package of radioactive materials may be carried among packaged general cargo without special stowage provisions, if:

(1) The heat output in watts does not exceed 0.1 times the minimum package dimension in centimeters; or

(2) The average surface heat flux of the package does not exceed 15 watts per square meter and the immediately surrounding cargo is not in sacks or bags or otherwise in a form that would seriously impede air circulation for heat removal.

(c) Packages bearing labels prescribed in § 172.403 of this subchapter may not be carried in compartments occupied by passengers, except in those compartments exclusively reserved for couriers accompanying those packages.

(d) Mixing of different kinds of packages, including Fissile Class I packages with Fissile Class II packages, is authorized in accordance with § 173.459.

(e) No person shall offer for transportation aboard a passenger-carrying aircraft any single package with a transport index greater than 3.0 or an overpack with a transport index greater than 3.0.

(f) No person shall offer for transportation aboard a passenger-carrying aircraft any radioactive material unless that material is intended for use in, or incident to, research, medical diagnosis or treatment.

(g) If an overpack is used to consolidate individual packages of radioactive materials, the packages shall comply with the packaging, marking, and labeling requirements of this subchapter, and the following:

(1) The overpack shall be labeled as prescribed in § 172.403 of this subchapter except as follows:

(i) the "contents" entry on the label may state "mixed" unless each inside package contains the same radionuclide(s).

(ii) The "activity" entry on the label must be determined by adding together the number of curies of the radioactive materials packages contained therein.

(iii) For a non-rigid overpack, the required label together with required package markings shall be affixed to the overpack by means of a securely attached, durable tag. The transport index shall be determined by adding together the transport indexes of the radioactive materials packages contained therein.

(iv) For a rigid overpack, the transport index shall be determined by:

(A) Adding together the transport indexes of the radioactive materials packages contained in the overpack; or

(B) Except for fissile radioactive materials, direct measurements as prescribed in § 173.403(bb) which have been taken by the person initially offering the packages contained within the overpack for shipment.

(2) The overpack shall be marked as prescribed in Subpart D of Part 172 of this subchapter and § 173.25(a).

(3) The transport index of the overpack shall not exceed 3.0 for passenger-carrying aircraft shipments, or 10.0 for cargo-aircraft only shipments.

[Amdt. 173-162, 48 FR 10226, Mar. 10, 1983, as amended by Amdt. 173-167, 48 FR 30138, June 30, 1983; Amdt. 173-162, 48 FR 31219, July 7, 1983; Amdt. 173-16, 48 FR 50461, Nov. 1, 1983; Amdt. 173-187, 50 FR 21051, May 22, 1985]

§ 173.451 Fissile materials—general requirements.

(a) Except as provided in § 173.453, each package containing fissile radioactive materials must comply with §§ 173.451 through 173.459.

§ 173.453 Fissile materials—exceptions.

The requirements of §§ 173.451 through 173.459 do not apply to:

(a) A package containing not more than 15 grams of fissile radionuclides. If the material is transported in bulk, the quantity limitation applies to the conveyance;

(b) A package containing irradiated natural or depleted uranium including the products of irradiation if the irradiation has taken place only in the thermal reactor;

(c) A package containing homogeneous solutions or mixtures where:

(1) The minimum ratio of the number of hydrogen atoms to the number of atoms of fissile radionuclides (H/X) is 5200;

(2) The maximum concentration of fissile radionuclides is 5 grams per liter; and

(3) The maximum mass of fissile radionuclides in the package is 500 grams, except for a mixture where the total mass of plutonium and uranium-233 does not exceed 1% of the mass of uranium-235 the limit is 800 grams. If the material is transported in bulk, the quantity limitations apply to the conveyance;

(d) A package containing uranium enriched in uranium-235 to a maximum of 1% by weight, and with a total plutonium and uranium-233 content of up to 1% of the mass of uranium-235, if the fissile radionuclides are distributed homogeneously throughout the package contents, and do not form a lattice arrangement within the package;

(e) A package containing any fissile material if it does not contain more than 5 grams of fissile radionuclides in any 10-liter volume, and if the material is packaged so as to maintain this limit of fissile radionuclide concentration during normal transport;

(f) A package containing not more than one kilogram of plutonium of which not more than 20% by mass may consist of plutonium-239, plutonium-241, or any combination of those radionuclides;

(g) A package containing liquid solutions of uranyl nitrate enriched in uranium-235 to a maximum of 2% by weight, with total plutonium and uranium-233 not more than 0.1% of the mass of uranium-235; or

(h) A package containing thorium or uranium with not more than 0.72% by weight of fissile material used for shipment solely within the United States.

[Amdt. 173-162, 48 FR 10226, Mar. 10, 1983, as amended at 48 FR 31219, July 7, 1983]

§ 173.455 Classification of fissile materials packages.

(a) Except as provided in § 173.453, each package of fissile materials shall be classified as follows:

(1) *Fissile Class I.* Packages that may be transported in unlimited number, and in any arrangement, and that require no nuclear criticality safety controls during transportation. A transport index is not assigned to Fissile Class I packages for the purposes of nuclear criticality safety control, although, the external radiation levels may require a transport index number.

(2) *Fissile Class II.* Packages that may be transported together in any arrangement but in numbers that do not exceed an aggregate transport index of 50. For the purposes of nuclear criticality safety control, individual packages may have a transport index of not less than 0.1 and not more than 10. However, the external radiation levels may require a higher transport index number. These shipments require no nuclear criticality safety control by the shipper during transportation.

(3) *Fissile Class III.* Shipments of packages of fissile materials that do not meet the requirements of Fissile Class I or Fissile Class II and that are controlled in transportation as prescribed in § 173.457 by appropriate arrangements between the shipper and the carrier.

(b) The numerical values for package assignments as Fissile Class I, the transport indexes for Fissile Class II packages, and the conveyance and vehicle limitations for Fissile Class III shipments shall be determined in accordance with 10 CFR Part 71.

[Amdt. 173-162, 48 FR 10226, Mar. 10, 1983, as amended at 48 FR 31219, July 7, 1983]

§ 173.457 Transportation of Fissile Class III shipments-specific requirements.

(a) Fissile Class III shipments shall incorporate transportation controls which are performed by the shipper or carrier, as appropriate, and which:

(1) Provide nuclear criticality safety;

(2) Protect against loading, storing, or transporting that shipment with any other fissile material; and

(3) Include in the shipping papers the description required by § 172.203(d) of this subchapter.

(b) Fissile Class III shipments shall be transported:

(1) In a conveyance (transport vehicle if transported by public highway or rail) assigned to the exclusive use of the shipper with a specific restriction for the exclusive use to be provided in the appropriate arrangements between shipper and carrier and with instructions to that effect issued with the shipping papers;

(2) Except for shipments by aircraft, with an escort in a vehicle having the capability, equipment, authority, and instructions to provide administrative controls necessary to assure compliance with this section;

(3) In a conveyance (transport vehicle if transported by public highway or rail) containing no other packages of radioactive material that are required to bear one of the labels prescribed in § 172.403 of this subchapter. Specific arrangements must be made between the shipper and the carrier, with instructions to that effect issued with the shipping papers; or

(4) Under any other procedure specifically authorized by the Director, OHMT in accordance with Part 107 of this subchapter.

(The information collection requirements contained in paragraph (b) were approved by the Office of Management and Budget under control number 2137-0535)

[Amdt. 173-162, 48 FR 10226, Mar. 10, 1983, as amended at 48 FR 31219, July 7, 1983]

§ 173.459 Mixing of fissile material packages.

Shipments of fissile materials packages and the commingling of fissile materials packages with other radioactive materials packages shall be in accordance with the provisions of this section.

(a) Mixing of fissile material packages with other types of radioactive materials, including Fissile Class I with Fissile Class II packages is authorized if the total transport index in any conveyance (transport vehicle if transported by public highway or rail) or storage location does not exceed 50.

(b) For Fissile Class II packages shipped under the exclusive use provisions of § 173.441(b), the transport index number which is calculated for nuclear criticality control purposes shall not exceed 10 for any single package nor a total of 50 for the conveyance (transport vehicle if transported by public highway or rail).

(c) Fissile Class II packages may be shipped with an external radiation level greater than 10 millirem per hour at 1 meter (3.3 feet), and combined with other packages of the same or different designs in a Fissile Class III shipment, under the conditions prescribed in § 173.457, if:

(1) Each package in the shipment has been assigned a transport index for criticality control purposes in accordance with the Fissile Class II criteria;

(2) The transport index which has been assigned in the package approval for nuclear criticality control purposes does not exceed 10 for any single package;

(3) The total transport index for nuclear criticality control purposes does not exceed 100 for all packages in the shipment;

(4) The shipment complies with § 173.441(b); and

(5) The shipment is not transported by vessel.

(d) A Fissile Class III shipment of packages may be combined with other packages of the same or different design when each package has been assigned a transport index for nuclear criticality control purposes in accordance with Fissile Class II criteria, and may be combined with Fissile Class II packages into a Fissile Class III shipment under the conditions prescribed in § 173.457, if:

(1) The transport index which has been assigned in the package approval

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for nuclear criticality control purposes does not exceed 50 for any single package;

(2) The total transport index for nuclear criticality control purposes for all packages in the shipment does not exceed 100;

(3) The shipment satisfies the provisions of § 173.441(b) if any package has a radiation level exceeding 10 millirem per hour at 1 meter (3.3 feet) from any accessible external surface of the package; and

(4) The shipment is not transported by vessel.

[Amdt. 173-162, 48 FR 10226, Mar. 10, 1983, as amended at 48 FR 31219, July 7, 1983]

§ 173.461 Demonstration of compliance with tests.

(a) Compliance with the test requirements in §§ 173.463 through 173.469 shall be shown by any of the methods prescribed in this paragraph, or by a combination of these methods appropriate for the particular feature being evaluated:

(1) By performance of tests with prototypes or samples of the packaging or special form material as normally presented for transportation, in which case the contents of the packaging for the test shall simulate as closely as practicable the expected normal radioactive contents. The use of nonradioactive substitute contents is encouraged provided that the results of the testing take into account the radioactive characteristics of the contents for which it is being tested;

(2) By reference to a previous, satisfactory demonstration of compliance of a sufficiently similar nature;

(3) By performance of tests with models of appropriate scale incorporating those features that are significant with respect to the item under investigation, when engineering experience has shown results of those tests to be suitable for design purposes. When a scale model is used, the need for adjusting certain test parameters, such as the penetrator diameter or the compressive load, must be taken into account; or

(4) By engineering evaluation or comparative data.

(b) With respect to the initial conditions for the tests under §§ 173.463 through 173.469, except for the water immersion tests, compliance shall be based upon the assumption that the package is in equilibrium at an ambient temperature of 38°C (100°F).

[Amdt. 173-162, 48 FR 10226, Mar. 10, 1983, as amended at 48 FR 31219, July 7, 1983]

§ 173.462 Preparation of specimens for testing.

(a) Each specimen (i.e., sample, prototype or scale model) shall be examined before testing to identify and record faults or damage, including:

(1) Divergence from the specifications or drawings;

(2) Defects in construction;

(3) Corrosion or other deterioration; and

(4) Distortion of features.

(b) Any deviation found under paragraph (a) of this section from the specified design shall be corrected or suitably taken into account in the subsequent evaluation.

(c) The containment system of the packaging shall be clearly specified.

(d) The external features of the specimen shall be clearly identified so that reference may be made to any part of it.

§ 173.463 Packaging and shielding—testing for integrity.

After each of the applicable tests specified in §§ 173.465 and 173.466, the integrity of the packaging, or of the packaging and its shielding, shall be retained to the extent required by § 173.412(m) for the packaging being tested

§ 173.465 Type A packaging tests.

(a) The proposed packaging with proposed contents must be capable of withstanding the tests prescribed in this section. One prototype may be used for all tests if the requirements of paragraph (b) of this section are complied with.

(b) *Water spray test.* The water spray test must precede each test or test sequence prescribed in this section. The water spray test shall simulate exposure to rainfall of approximately 5 centimeters (2 inches) per hour for at least one hour. The time interval between the end of the water spray test and the beginning of the next test shall be such that the water has soaked-in to the maximum extent without appreciable drying of the exterior of the specimen. In the absence of evidence to the contrary, this interval may be assumed to be two hours if the water spray is applied from four different directions simultaneously. However, no time interval may elapse if the water spray is applied from each of the four directions consecutively.

(c) *Free drop test.* The free drop test consists of a fall onto the target in a manner that causes maximum damage to the safety features being tested, and:

(1) For packages weighing 5,000 kilograms (11,000) pounds) or less, the distance of the fall measured from the lowest point of the packaging to the upper surface of the target shall not be less than 1.2 meters (4 feet).

(2) For packages weighing more than 5,000 kilograms (11,000 pounds), the distance of the fall shall not be less than the distance specified in Table 11, for the applicable packaging weight:

TABLE 11—FREE-FALL DISTANCE FOR PACKAGINGS WEIGHING MORE THAN 5,000 KILOGRAMS

Packaging weight		Free-fall distance	
Kilograms	Pounds	Feet	Meters
>5,000 to 10,000	>11,000 to 22,000	3	0.9
>10,000 to 15,000	>22,000 to 33,000	2	0.6
More than 15,000	More than 33,000	1	0.3

(3) For Fissile Class II packagings, the free drop specified in subparagraph (1) or (2) of this paragraph shall be preceded by a free drop from a height of .3 meter (1 foot) on each corner. For cylindrical packagings, the .3 meter (1 foot) drop shall be onto each of the quarters of each rim.

(4) For fiberboard or wood rectangular packages not exceeding 50 kilograms (110 pounds) in weight, a separate specimen of the proposed packaging shall be subjected to a free drop onto each corner from a height of .3 meter (1 foot).

(5) For fiberboard cylindrical packages weighing not more than 100 kilograms (220 pounds) a separate specimen of the proposed packaging shall be subjected to a free drop onto each of the quarters of each rim from a height of .3 meter (1 foot).

(6) The target shall have a flat, horizontal surface of such mass and rigidity that any increase in its resistance to displacement or deformation upon impact by the specimen would not significantly increase the damage to the specimen.

(d) *Compression test.* The compression test shall last for a period of at least 24 hours and consists of a compressive load equivalent to the greater of the following:

(1) Five times the weight of the actual package; or

(2) 1300 kilograms per square meter (265 pounds per square foot) multiplied by the horizontally projected area of the package. The compressive load shall be applied uniformly to two opposite sides of the packaging specimen, one of which must be the base on which the package would normally stand.

(e) *Penetration test.* For the penetration test the packaging specimen shall be placed on a rigid, flat, horizontal surface that will not move while the test is being performed. The test shall consist of:

(1) A bar of 3.2 centimeters (1.25 inches) in diameter with a hemispherical end, weighing 6 kilograms (13.2 pounds) being dropped with its longitudinal axis vertical, onto the center of the weakest part of the packaging specimen, so that, if it penetrates far enough, it will hit the containment system. The bar must not be deformed by the test; and

(2) The distance of the fall of the bar measured from its lower end to the upper surface of the packaging specimen shall not be less than 1 meter (3.3 feet).

[Amdt. 173-162, 48 FR 10226, Mar. 10, 1983, as amended at 48 FR 31219, July 7, 1983; Amdt. 173-16, 48 FR 50461, Nov. 1, 1983]

§ 173.466 Additional tests for Type A packagings designed for liquids and gases.

(a) In addition to the tests prescribed in § 173.465, Type A packagings designed for liquids and gases shall be capable of withstanding the following tests:

(1) *Free drop test.* The packaging specimen shall fall onto the target in a manner which will cause it to suffer the maximum damage to its containment. The distance of the fall measured from the lowest part of the packaging specimen to the upper surface of the target shall be not less than 9 meters (30 feet).

(2) *Penetration test.* The specimen must be subjected to the test specified in § 173.465(e) except that the distance of the fall shall be 1.7 meters (5.5 feet).

§ 173.467 Tests for demonstrating the ability of Type B and fissile radioactive materials packagings to withstand accident conditions in transportation.

Each Type B packaging or packaging for fissile material shall meet the test requirements prescribed in 10 CFR Part 71 for ability to withstand accident conditions in transportation.

§ 173.469 Tests for special form radioactive materials.

(a) Special form radioactive materials must meet the test requirements of paragraph (b) of this section. Each solid radioactive material or capsule specimen to be tested shall be manufactured or fabricated so that it is representative of the actual solid material or capsule which will be transported with the proposed radioactive content duplicated as closely as practicable. Any differences between the material to be transported and the test material such as the use of non-radioactive contents shall be taken into account. In addition:

(1) A different specimen may be used for each of the tests;

(2) The specimen must not break or shatter when subjected to the impact, percussion, or bending tests;

(3) The specimen must not melt or disperse when subjected to the heat test; and

(4) After each test, leaktightness or indispersibility of the specimen shall be determined by a method no less sensitive than the leaching assessment prescribed in paragraph (c) of this section. For a capsule resistant to corrosion by water, and which has an internal void volume greater than 0.1 milliliters, an alternative to the leaching assessment is a demonstration of leaktightness of 10^{-4} torr-1/s (1.3×10^{-4} atm-cm^3/s) based on air at 25°C (77°F) and one atmosphere differential pressure for solid radioactive content, or 10^{-6} torr-1/s (1.3×10^{-6} atm-cm^3/s) for liquid or gaseous radioactive content.

(b) Test methods. (1) Impact Test. The specimen must fall onto the target from a height of not less than 9 meter (30 feet). The target must be as specified in § 173.465(c)(6);

(2) Percussion Test. (i) The specimen shall be placed on a sheet of lead that is supported by a smooth solid surface, and be struck by the flat face of a steel billet so as to produce an impact equivalent to that resulting from a free fall of 1.4 kilograms (3 pounds) through 1 meter (3.3 feet);

(ii) The flat face of the billet shall be 25 millimeters (1 inch) in diameter with the edges rounded off to a radius of 3 millimeters ±0.3 millimeters (.12 inch ±.012 inch);

(iii) The lead shall be of a hardness within 3.5 to 4.5 on the Vickers scale, and not more than 25 millimeters (1 inch) thick, and shall cover an area greater than that covered by the specimen;

(iv) A fresh surface of lead shall be used for each impact; and

(v) The billet must strike the specimen in a manner that causes maximum damage.

(3) Bending test. (i) This test applies only to long, slender sources with a length of 10 centimeters (4 inches) or more and with a length at least 10 times the minimum width;

(ii) The specimen must be securely clamped in a horizontal position so that one half of its length protrudes from the face of the clamp;

(iii) The position of the specimen must be such that it will suffer maximum damage when its free end is struck by the flat face of a steel billet;

(iv) The billet must strike the specimen in a manner that produces an impact equivalent to that resulting from a free vertical fall of 1.4 kilograms (3 pounds) through 1 meter (3.3 feet); and

(v) The flat face of the billet must be 25 millimeters (1 inch) in diameter with the edges rounded off to a radius of 3 millimeters ±0.3 millimeters (.12 inch ±.012 inch).

(4) Heat test. The specimen shall be heated in air to a temperature of not less than 800°C (1472°F), held at that temperature for a period of 10 minutes, and then allowed to cool.

(c) Leaching assessment methods. (1) For indispersible solid material—(i) The specimen shall be immersed for seven days in water at ambient temperature. The water must have a pH of 6-8 and a maximum conductivity of 10 micromho per centimeter at 20°C (68°F);

(ii) The water and specimen shall then be heated to a temperature of 50°C±5° (122°F±9°) and maintained at this temperature for four hours;

(iii) The activity of the water shall then be determined;

(iv) The specimen shall then be stored for at least seven days in still air with humidity not less than 90 percent at 30°C (86°F);

(v) The specimen shall then be immersed in water with the same pH and maximum conductivity specifications as in subparagraph (1)(i) of this paragraph. The water and specimen must be heated to 50°C±5° (122°F±9°) and maintained at that temperature for four hours;

(vi) The activity of the water shall then be determined. The activities determined in subparagraph (1)(iii) and this subparagraph shall not exceed 0.05 microcuries.

(2) For encapsulated material—(i) The specimen shall be immersed in water at ambient temperature. The water must have a pH of 6-8 and a maximum conductivity of 10 micromho per centimeter. The water and specimen shall be heated to a temperature of 50°C±5° (122°F±9°) and maintained at this temperature for four hours;

(ii) The activity of the water shall then be determined;

(iii) The specimen shall then be stored for at least seven days in still air at a temperature not less than 30°C (86°F);

(iv) Step (i) shall be repeated; and

(v) The activity of the water shall be determined. The activities determined in paragraph (c)(2)(ii) and this paragraph (c)(2)(v) shall not exceed 0.05 microcuries.

[Amdt. 173-162, 48 FR 10226, Mar. 10, 1983, as amended at 48 FR 31219, July 7, 1983]

§ 173.471 Requirements for U.S. Nuclear Regulatory Commission approved packages.

In addition to the applicable requirements of the U.S. Nuclear Regulatory Commission (USNRC) and Parts 171-177 of this subchapter, any shipper of a Type B, Type B(U), Type B(M), or fissile material package that has been approved by the USNRC in accordance with 10 CFR Part 71 shall also comply with the following requirements:

(a) The shipper shall be registered with the USNRC as a party to the approval, and the shipment must be made in compliance with the terms of the approval;

(b) The outside of each package shall be durably and legibly marked with the package identification marking indicated in the USNRC approval;

(c) Each shipping paper related to the shipment of the package shall bear the package identification marking indicated in the USNRC approval;

(d) Before the first export shipment of the package, the shipper shall obtain a U.S. Competent Authority Certificate for that package design or if one has already been issued, the shipper shall register with the U.S. Competent Authority as a user of the certificate. Upon registration as a user of the certificate the shipper will be furnished with a copy of it. The shipper shall then submit a copy of the U.S. Competent Authority Certificate applying to that package design to the national competent authority of each country into or through which the package will be transported, unless a copy has already been furnished;

(e) The U.S. Competent Authority responsible for administering the requirements of Section VIII of the IAEA "Regulations for the Safe Transport of Radioactive Materials, Safety Series No. 6, 1973 Revised Edition (as amended)," is the:

Research and Special Programs Administration, Office of Hazardous Materials Transportation (OHMT), U.S. Department of Transportation, Washington, D.C. 20590.

(f) Each request for a U.S. Competent Authority Certificate as required by the IAEA regulations shall be submitted in writing to the address set forth in paragraph (e) of this section. The request shall be in duplicate and include copies of the applicable USNRC approval and a reproducible drawing showing the make-up of the package. Each request is considered in the order in which it is received. To allow sufficient consideration by OHMT, requests should be received at least 45 days before the requested effective date; and

(g) Import and export shipments may be made in accordance with § 171.12 of this subchapter.

(The information collection requirements contained in paragraph (a) were approved by the Office of Management and Budget under control number 2137-0512. The information collection requirements contained in paragraph (d) were approved under control number 2137-0515. The information collection requirements contained in paragraph (e) were approved under control number 2137-0514)

[Amdt. 173-162, 48 FR 10226, Mar. 10, 1983, as amended at 48 FR 31219, July 7, 1983]

§ 173.472 Requirements for exporting DOT Specification Type B and fissile packages.

(a) Any shipper who exports a DOT Specification Type B or fissile material package authorized by § 173.416 or § 173.417 shall comply with paragraphs (b) through (f) of this section.

(b) The shipper shall register with the U.S. Competent Authority as a user of the appropriate U.S. Competent Authority Certificate and the shipment shall be made in accordance with the certificate;

(c) The outside of each package must be durably and legibly marked with the package identification marking indicated in the U.S. Competent Authority Certificate;

(d) Each shipping paper related to the shipment of the package must bear the package identification marking indicated in the U.S. Competent Authority Certificate;

(e) Before the first export shipment of the package, the shipper must submit a copy of the U.S. Competent Authority Certificate applying to that package design to the national competent authority of each country into or through which the package will be transported, unless a copy has already been furnished; and

(f) Import and export shipments may be made in accordance with § 171.12 of this subchapter.

(The information collection requirements contained in paragraphs (b) and (e) were approved by the Office of Management and Budget under control number 2137-0515)

§ 173.473 Requirements for foreign-made packages.

In addition to the applicable requirements of Parts 171 through 177 of this subchapter, each shipper of a foreign-made Type B, Type B(U), Type B(M), or fissile material package for which a competent authority certificate is required by the IAEA "Regulations for the Safe Transport of Radioactive Materials, Safety Series No. 6, 1973 Revised Edition (as amended)" shall also comply with the following requirements:

(a) Prior to the first shipment of such a package of radioactive materials into or from the U.S., the shipper shall:

(1) Have the foreign competent authority certificate revalidated by the U.S. Competent Authority, unless this has been done previously. The request must be in duplicate and contain all the information required by Section VIII of the IAEA regulations. Each request is considered in the order in which it is received. To allow sufficient consideration by OHMT, requests should be received at least 45 days before the requested effective date.

(2) Submit a copy in English of the foreign competent authority certificate with the request for revalidation;

(3) Register its identity in writing with the U.S. Competent Authority as a user of the package covered by the foreign competent authority certificate and its revalidation. If the shipper is requesting the revalidation, this is automatically done by OHMT; and

(4) Supply to the carrier, upon request, the applicable competent au-

thority certificates. However, the competent authority certificates are not required to accompany the packages to which they apply.

(b) The outside of each package shall be durably and legibly marked with the same competent authority identification marking indicated on the competent authority certificate and revalidation;

(c) Each shipping paper for a shipment of radioactive materials shall bear a notation of the package identification marking indicated on the competent authority certificate or revalidation;

(d) All requirements of the foreign competent authority certificate and the U.S. Competent Authority revalidation shall be fulfilled; and

(e) Import and export shipments may be made in accordance with § 171.12 of this subchapter.

(The information collection requirements contained in paragraph (a) were approved by the Office of Management and Budget under control number 2137-0517)

[Amdt. 173-162, 48 FR 10226, Mar. 10, 1983, as amended at 48 FR 31219, July 7, 1983]

§ 173.474 Quality control for construction of packaging.

(a) Prior to the first use of any packaging for the shipment of radioactive material, the shipper shall determine, that:

(1) The packaging meets the quality of design and construction requirements as specified in this subchapter; and

(2) The effectiveness of the shielding, containment, and, when required, the heat transfer characteristics of the package, are within the limits specified for the package design.

§ 173.475 Quality control requirements prior to each shipment of radioactive materials.

Before each shipment of any radioactive materials package, the shipper shall ensure by examination or appropriate tests, that:

(a) The packaging is proper for the contents to be shipped;

(b) The packaging is in unimpaired physical condition, except for superficial marks;

(c) Each closure device of the packaging, including any required gasket, is properly installed, secured, and free of defects;

(d) For fissile material, each moderator and neutron absorber, if required, is present and in proper condition;

(e) Each special instruction for filling, closing, and preparation of the packaging for shipment has been followed;

(f) Each closure, valve, or other opening of the containment system through which the radioactive content might escape is properly closed and sealed;

(g) Each packaging containing liquid in excess of an A_2 quantity and intended for air shipment has been tested to show that it will not leak under an ambient atmospheric pressure of not more than 0.25 atmosphere, absolute, (0.25 kilograms per square centimeter or 3.6 psia). The test must be conducted on the entire containment system, or on any receptacle or vessel within the containment system, to determine compliance with this requirement;

(h) The internal pressure of the containment system will not exceed the design pressure during transportation; and

(i) External radiation and contamination levels are within the allowable limits specified in this subchapter.

[Amdt. 173-162, 48 FR 10226, Mar. 10, 1983, as amended at 48 FR 31219, July 7, 1983]

§ 173.476 Approval of special form radioactive materials.

(a) Each shipper of special form radioactive materials shall maintain on file for at least one year after the latest shipment, and provide to the RSPA on request, a complete safety analysis, including documentation of any tests, demonstrating that the special form material meets the requirements of § 173.469. An IAEA Certificate of Competent Authority issued for the special form material may be used to satisfy this requirement.

(b) Prior to the first export shipment of a special form radioactive material from the United States, each shipper shall obtain a Competent Authority Certificate for the specific material. For special form material manufactured outside the United States an IAEA Certificate of Component Authority from the country of origin may be used to meet this requirement. For special form materials manufactured in the United States each shipper shall obtain a U.S. Competent Authority Certificate for the specific material. Each petition for a U.S. Competent Authority Certificate shall be submitted in accordance with § 173.471(e) and must include the following information:

(1) A detailed description of the material or if a capsule, a detailed description of the contents. Particular reference must be made to both physical and chemical states;

(2) If a capsule is to be used, a detailed statement of its design and dimensions, including complete engineering drawings and schedules of material, and methods of construction; and

(3) A statement of the tests that have been made and their results; evidence based on calculative methods to show that the material is able to pass the tests; or other evidence that the special form radioactive material complies with § 173.469.

(c) Paragraphs (a) and (b) of this section do not apply in those cases where A_1 equals A_2 and the material is not described on the shipping papers as "Radioactive Material, Special Form, n.o.s."

(The information collection requirements contained in paragraph (a) were approved by the Office of Management and Budget under control number 2137-0516. The information collection requirements contained in paragraph (b) were approved under control number 2137-0518)

[Amdt. 173-162, 48 FR 10226, Mar. 10, 1983, as amended at 48 FR 31219, July 7, 1983]

§ 173.477 Approval for export shipments.

(a) Each export shipment of a package for which an IAEA certificate of competent authority has been issued or revalidated in accordance with §§ 173.471, 173.472, or 173.473 shall have multilateral approval, if the shipment includes:

(1) A vented Type B(M) package;

(2) A Type B(M) packaging containing radioactive materials with an activity greater than 3×10^3 A_1, or 3×10^3 A_2, as appropriate, or 3×10^4 curies, whichever is less;

(3) A Fissile Class III shipment; or

(4) Transportation by special arrangement.

(b) Each application for shipment approval shall contain:

(1) The period of time for which the approval is sought;

(2) A description of the contents, the expected modes of transportation, the type of conveyance to be used, and the proposed route; and

(3) An explanation of how the special precautions and special administrative and operational controls referred to in the package design certificates are to be put into effect.

(c) The packaging and shipment approvals may be combined into a single approval issued in accordance with §§ 173.471, 173.472 or 173.473.

(d) Approval by competent authorities is not required for packagings designed for materials covered by §§ 173.421 through 173.427 nor for Type A packagings designed for nonfissile radioactive materials.

(The information collection requirements contained in paragraph (b) were approved by the Office of Management and Budget under control number 2137-0532)

[Amdt. 173-162, 48 FR 10226, Mar. 10, 1983, as amended at 48 FR 31220, July 7, 1983]

§ 173.478 Notification to competent authorities for export shipments.

(a) Before the first export shipment of any packaging with contents exceeding A_1 or A_2, the shipper shall ensure that copies of each applicable competent authority certificate issued in accordance with § 173.471, § 173.472, or § 173.473 have been submitted to the competent authority of each country through which or into which it is to be transported. The shipper is not required to await an acknowledgment from the competent authority prior to shipping the radioactive material, nor is the competent authority required to acknowledge receipt of the certificate.

(b) For each of the shipments described in this paragraph, the shipper shall notify the competent authority of each country through which or into which the shipment is to be transported. This notification must be received by each competent authority at least 15 days before the shipment starts for the following:

(1) Type B(U) packagings containing radioactive materials with an activity greater than 3×10^3 A_1, 3×10^3 A_2, as appropriate, or 3×10^4 curies, whichever is the least;

(2) Type B(M) packages;

(3) Fissile Class III shipments under Section VIII of the IAEA "Regulations for the Safe Transport of Radioactive Materials, Safety Series No. 6, 1973 Revised Edition (as amended)"; or

(4) Transportation by special arrangements.

(c) The shipper notification must include:

(1) Sufficient information to enable the packaging to be identified, including all applicable certificate numbers and identification marks; and

(2) Information as to the date of shipment, the expected date of arrival, and the proposed routing.

(d) The shipper is not required to send a separate notification if the required information has been included in the application for shipment approval.

(The information collection requirements contained in paragraph (a) were approved by the Office of Management and Budget under control number 2137-0515. The information collection requirements contained in paragraphs (b) and (c) were approved under control number 2137-0532)

[Amdt. 173-162, 48 FR 10226, Mar. 10, 1983, as amended at 48 FR 31220, July 7, 1983]

Subpart J—Other Regulated Material; Definition and Preparation

SOURCE: Amdt. 173-94, 41 FR 16087, Apr. 15, 1976, unless otherwise noted.

§ 173.500 Definitions.

(a) An Other Regulated Material (ORM) is a material that:

(1) May pose an unreasonable risk to health and safety or property when transported in commerce; and

(2) Does not meet any of the definitions of the other hazard classes specified in this subchapter, or

(3) Has been reclassed an ORM (specifically or permissively) according to this subchapter.

NOTE: There is no change in the applicability of Subparts K, L, and M of this Part for materials classed as ORM-A, B, or C when they are hazardous substances or hazardous wastes (see § 172.101(g)(1)).

(b) ORM's are divided into classes as follows:

(1) An ORM-A material is a material which has an anesthetic, irritating, noxious, toxic, or other similar property and which can cause extreme annoyance or discomfort to passengers and crew in the event of leakage during transportation.

(2) An ORM-B material is a material (including a solid when wet with water) capable of causing significant damage to a transport vehicle from leakage during transportation. Materials meeting one or both of the following criteria are ORM-B materials:

(i) A liquid substance that has a corrosion rate exceeding 0.250 inch per year (IPY) on aluminum (nonclad 7075-T6) at a test temperature of 130° F. An acceptable test is described in NACE Standard TM-01-69.

(ii) Specifically designated by name in § 172.101 of this subchapter.

(3) An ORM-C material is a material which has other inherent characteristics not described as an ORM-A or ORM-B but which make it unsuitable for shipment, unless properly identified and prepared for transportation. Each ORM-C material is specifically named in § 172.101 of this subchapter.

(4) An ORM-D material is a material such as a consumer commodity which, though otherwise subject to the regulations of this subchapter, presents a limited hazard during transportation due to its form, quantity and packaging. They must be materials for which exceptions are provided in § 172.101 of this subchapter. A shipping description applicable to each ORM-D material or category of ORM-D materials is found in § 172.101 of this subchapter.

(5) An ORM-E is a material that is not included in any other hazard class, but is subject to the requirements of this subchapter. Materials in this class include:

(i) Hazardous waste.

(ii) Hazardous substances as defined in § 171.8 of this subchapter.

[Amdt. 173-94, 41 FR 16087, Apr. 15, 1976, as amended by Amdt. 173-137, 45 FR 34704, May 22, 1980; Amdt. 173-137, 45 FR 74669, Nov. 10, 1980; Amdt. 73-149, 46 FR 49905, Oct. 8, 1981]

§ 173.505 Exceptions for Other Regulated Material (ORM).

(a) The following ORM's, unless otherwise provided by § 172.101 of this subchapter, are not subject to the requirements of this subchapter, except §§ 173.6, 173.21 and 173.24, and Subparts C and D of Part 172 of this subchapter when packaged as follows:

(1) ORM—A, B, or C liquid, not over one pint in one packaging;

(2) ORM—A or B solid, not over five pounds in one packaging;

(3) ORM—C solid, not over twenty-five pounds in one packaging.

(b) Strong outside packaging as specified in § 173.1200 and marking requirements specified in § 172.316 of this subchapter are not required for materials classed as ORM-D when unitized in cages, carts, or similar overpacks and when shipped by a private or contract motor carrier from a distribution center to a retail outlet.

[Amdt. 173-94, 41 FR 16087, Apr. 15, 1976, as amended by Amdt. 173-137, 45 FR 34704, May 22, 1980; Amdt. 173-165, 48 FR 28102, June 20, 1983]

§ 173.510 General packaging requirements.

(a) Except as provided in § 173.505, ORM materials must be prepared for shipment in compliance with the following:

(1) Each material must be offered for transportation and transported in compliance with Subparts B, C, and D of Part 172 of this subchapter and Subparts A and B of Part 173. [Note: Packaging for certain PCB's for disposal, and for storage for disposal is prescribed by EPA in 40 CFR 761.60 and 761.65.]

(2) For packagings of 110 gallon capacity or less, sufficient outage (ullage) must be provided so the packaging will not be liquid full at 130° F. (55° C.).

(3) When a liquid or solid has an absolute vapor pressure exceeding 16 p.s.i. at 100° F. (38° C.), the primary packaging must be capable of withstanding the inside vapor pressure at 130° F. without leakage.

(4) Any material classed as an ORM material, which may cause a hazard in transportation due to its reaction with water, must be packaged with either an inner or outer water proof packaging.

(5) Portable tanks, tank cars, cargo tanks, hopper and dump type transport vehicles must be free from leaks and all discharge openings must be securely closed during transportation.

[Amdt. 173-94, 41 FR 16087, Apr. 15, 1976, as amended by Amdt. 173-137, 45 FR 34704, May 22, 1980; Amdt. 173-16, 48 FR 50461, Nov. 1, 1983]

Subpart K—Other Regulated Material; ORM-A

Source: Amdt. 173-94, 41 FR 16087, Apr. 15, 1976, unless otherwise noted.

§ 173.605 Ammonium hydrosulfide solution, ammonium polysulfide solution, bromochloromethane, dibromodifluoro-methane, dichlorodifluoroethylene; dichloromethane, 1,1,1-trichloroethane, perfluoro-2-butene, tetrachloroethylene, and trichloroethylene.

(a) Ammonium hydrosulfide solution, ammonium polysulfide solution, bromochloromethane, dibromodifluoro-methane, dichlorodifluoroethylene, dichloromethane, 1,1,1-trichloroethane, perfluoro-2-butene, tetrachloroethylene, and trichloroethylene, when offered for transportation on a passenger-carrying aircraft, must be prepared for shipment in compliance with § 173.510 and must be packaged as follows:

(1) Wooden box with inside earthenware, glass, metal, or plastic packagings of not more than 2 gallons capacity each, with sufficient cushioning and absorbent material to prevent breakage and leakage.

(2) Fiberboard box with inside earthenware, glass, metal, or plastic packagings of not more than 1 gallon capacity each, with sufficient cushioning and absorbent material to prevent breakage and leakage.

(3) Metal drum of not more than 10 gallons capacity.

(4) Outside packaging with inside earthenware, glass, plastic, or metal packagings of not more than 4 fluid ounces capacity each, with sufficient cushioning and absorbent material to prevent breakage and leakage. The maximum amount that may be shipped in any one outside packaging is 5 gallons.

[Amdt. 173-94, 41 FR 16087, Apr. 15, 1976, as amended by Amdt. 173-16, 48 FR 50461, Nov. 1, 1983]

§ 173.610 Camphene.

(a) Camphene, when offered for transportation by water, must be prepared for shipment in compliance with § 173.510 and must be packaged in a wooden, metal, or rigid plastic packaging.

(b) Camphene, when offered for transportation by air, must be prepared for shipment in compliance with § 173.510 and must be packaged as prescribed in § 173.154.

[Amdt. 173-94A, 41 FR 40684, Sept. 20, 1976]

§ 173.615 Carbon dioxide, solid (dry ice).

(a) Solid carbon dioxide, when offered for transportation by aircraft or water, must be packed in packaging designed and constructed to permit the release of carbon dioxide gas to prevent a build-up of pressure that could rupture the packaging. For each shipment by air exceeding five pounds per package, advance arrangements between the shipper and each carrier must be made.

(b) Railroad cars and motor vehicles containing solid carbon dioxide, when accepted for transportation on board ocean vessels, must be conspicuously marked on two sides "WARNING—CO_2SOLID (DRY ICE)."

(c) Other packagings, when accepted for transportation on board ocean vessels, must be marked "CARBON DIOXIDE, SOLID—DO NOT STOW BELOW DECKS."

(d) Not more than 440 pounds of solid carbon dioxide may be transported in any one cargo pit or bin on any aircraft except by specific and special arrangement between the shipper and the aircraft operator.

(e) Carbon dioxide, solid (Dry ice) is excepted from the shipping paper and certification requirements of this subchapter if the requirements of paragraphs (a) and (d) of this section are complied with and the package is marked "Carbon dioxide, solid" or "Dry ice" and marked with an indication that the material being refrigerated is used for diagnostic or treatment purposes (e.g. Frozen medical specimens).

[Amdt. 173-94, 41 FR 16087, Apr. 15, 1976, as amended by Amdt. 173-103, 42 FR 5059, Jan. 27, 1977; Amdt. 173-135, 45 FR 13090, Feb. 28, 1980]

§ 173.620 Carbon tetrachloride, ethylene dibromide (1,2-dibromoethane), and tetrachloroethane.

(a) Carbon tetrachloride, ethylene dibromide, and tetrachloroethane, when offered for shipment by cargo aircraft only and water, must be prepared for shipment in compliance with § 173.510 and must be packaged as follows:

(1) As prescribed in §§ 173.344, 173.345 or § 173.346, meeting the packaging requirements applicable to Poison B liquids.

(2) Uniform Freight Classification (UFC), Rule 40, Section 5. Metal barrel or drum, not over 55 gallons capacity. Not authorized for transportation by air.

(3) Wooden box with inside containers, not over 200 pounds gross weight. Not authorized for transportation by air.

(4) Uniform Freight Classification (UFC), Rule 41, Sections 2 and 3. Fiberboard box, with inside containers, not over 90 pounds gross weight. Not authorized for transportation by air.

(5) Tank cars or motor vehicle tank trucks. Not authorized for transportation by air.

(6) Specification 51 (§ 178.245 of this subchapter). Portable tanks. Not authorized for transportation by air.

(7) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter) are authorized under conditions specified in the IM Tank Table.

(b) Carbon tetrachloride, ethylene dibromide, and tetrachloroethane, when offered for shipment by passen-

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ger-carrying aircraft, must be prepared for shipment in compliance with § 173.510 and must be packaged to meet the packaging requirements of § 173.345.

[Amdt. 173-94, 41 FR 16087, Apr. 15, 1976, as amended by Amdt. 173-94A, 41 FR 40684, Sept. 20, 1976; Amdt. 173-144, 46 FR 9894, Jan. 29, 1981; Amdt. 173-16, 48 FR 50461, Nov. 1, 1983]

§ 173.630 Chloroform.

(a) Chloroform, when offered for transportation by aircraft, must be prepared for shipment in compliance with § 173.510 and must be packaged as follows:

(1) Wooden box with inside earthenware, glass, metal, or plastic packaging of not more than 2 gallons capacity each.

(2) Fiberboard box with inside earthenware, glass, metal, or plastic packaging of not more than 1 gallon capacity each.

(3) Metal drum, not over 55 gallons capacity.

(4) Outer packaging with inside earthenware, glass, metal, or plastic packagings of not more than 4 fluid ounces capacity each, not exceeding 5 gallons total content.

(b) Chloroform, when offered for shipment by water, must be prepared for shipment in compliance with § 173.510 and must be packaged as follows:

(1) As prescribed in §§ 173.344, 173.345 or § 173.346 meeting the packaging requirements applicable to Poison B liquids.

(2) Uniform Freight Classification (UFC), Rule 40, Section 5. Metal barrel or drum, not over 55 gallons capacity.

(3) Wooden box with inside containers, not over 200 pounds gross weight.

(4) Uniform Freight Classification (UFC), Rule 41, Section 2 and 3. Fiberboard box with inside containers, not over 90 pounds gross weight.

(5) Specification IM 101 portable tanks (§§ 178.270, 178.271 of this subchapter) are authorized under conditions specified in the IM Tank Table.

[Amdt. 173-94, 41 FR 16087, Apr. 15, 1976, as amended by Amdt. 173-144, 46 FR 9894, Jan. 29, 1981]

§ 173.635 Ferrophosphorus.

(a) Ferrophosphorus, when offered for transportation by water, must be prepared for shipment in compliance with § 173.510 and must be packaged as follows:

(1) Steel barrel or drum;

(2) Wooden barrel or keg;

(3) Wooden box with inside container; or

(4) Sift-proof railroad freight car.

(5) Fiber drums having an aluminum foil barrier.

[Amdt. 173-94, 41 FR 16087, Apr. 15, 1976, as amended by Amdt. 173-102, 41 FR 55878, Dec. 23, 1976]

§ 173.645 Ferrosilicon.

(a) Ferrosilicon, containing 30 percent or more but not more than 70 percent silicon, when offered for shipment by water, must be prepared for shipment in compliance with § 173.510 and must be packaged as follows:

(1) Steel barrel or drum;

(2) Wooden barrel or keg; or

(3) Wooden box, not over 500 pounds gross weight.

(b) Ferrosilicon, containing 30 percent or more but not more than 70 percent silicon, when offered for shipment by cargo aircraft only must be prepared for shipment in compliance with §§ 173.510 and 173.154.

[Amdt. 173-94, 41 FR 16087, Apr. 15, 1976, as amended by Amdt. 173-16, 48 FR 50461, Nov. 1, 1983]

§ 173.650 Hexachloroethane.

(a) Hexachloroethane, when offered for shipment by water, must be prepared for shipment in compliance with § 173.510 and must be packaged as follows:

(1) As prescribed in §§ 173.363, 173.364 and 173.365, meeting the packaging requirements applicable to Poison B solids.

(2) Uniform Freight Classification (UFC), Rule 40, Section 5. Metal barrel or drum, not over 55 gallons capacity each.

(3) Wooden box with inside containers, not over 200 pounds gross weight.

(4) Uniform Freight Classification (UFC), Rule 41, Sections 2 and 3. Fiberboard box with inside containers, not over 90 pounds gross weight.

[Amdt. 173-94, 41 FR 16087, Apr. 15, 1976, as amended by Amdt. 173-94A, 41 FR 40684, Sept. 20, 1976]

§ 173.655 Naphthalene or naphthalin.

(a) Naphthalene or naphthalin, when offered for shipment by water, must be prepared for shipment in compliance with § 173.510 and must be packaged as follows:

(1) Wooden barrel or keg;

(2) Wooden box;

(3) Fiberboard box;

(4) Metal barrel or drum; or

(5) Burlap (jute) bag, not over 224 pounds net weight. Authorized only when the melting point is 167° F. or higher.

(b) Naphthalene or naphthalin, when offered for shipment by cargo aircraft only, must be prepared for shipment in compliance with § 173.510 and must be packaged as follows:

(1) As prescribed for passenger-carrying aircraft in paragraph (c) of this section, or

(2) As prescribed in § 173.154.

(c) Naphthalene or naphthalin, when offered for transportation by passenger-carrying aircraft, must be prepared for shipment in compliance with § 173.510 and must be packaged as follows:

(1) Earthenware, glass, metal, or plastic inside packagings of not more than 5 pounds capacity each, in strong outside packaging not over 25 pounds net weight.

[Amdt. 173-94, 41 FR 16087, Apr. 15, 1976, as amended by Amdt. 173-16, 48 FR 50461, Nov. 1, 1983]

Subpart L—Other Regulated Material; ORM-B

§ 173.800 Ammonium hydrogen sulfate, ammonium fluoride, barium oxide, chloroplatinic acid, copper chloride, ferric chloride, lead chloride, molybdenum pentachloride, potassium hydrogen sulfate, sodium aluminate, sodium hydrogen sulfate, and/or sodium hydrogen sulfite, (each in solid form).

(a) Ammonium hydrogen sulfate, ammonium fluoride, barium oxide, chloroplatinic acid, copper, chloride, ferric chloride, lead chloride, molybdenum pentachloride, potassium hydrogen sulfate, sodium aluminate, sodium hydrogen sulfate, or sodium hydrogen sulfite, when offered for transportation by passenger-carrying aircraft, must be prepared for shipment in compliance with § 173.510 and must be packaged as follows:

(1) Earthenware, glass, metal, or plastic inside packagings of not more than 5 pounds net capacity each. Inside packagings must be packed in strong outside packaging, containing not more than 25 pounds net weight.

[Amdt. 173-94, 41 FR 16088, Apr. 15, 1976, as amended by Amdt. 173-94B, 41 FR 57070, Dec. 30, 1976]

§ 173.850 Lime, unslaked; quicklime; and calcium oxide.

(a) Unslaked lime, quicklime, or calcium oxide when offered for transportation by cargo aircraft only or water, must be prepared for shipment in compliance with § 173.510 and must be packed in waterproof packaging as follows:

(1) Steel barrel or drum;

(2) Wooden barrel or keg;

(3) Wooden box;

(4) Multi-wall paper bag, not over 100 pounds net weight;

(5) Paper-lined burlap bag, not over 100 pounds net weight; or

(6) Sift-proof railroad freight car.

(7) Sift-proof bulk freight container with net weight not over 40,000 pounds.

(8) Portable tank with gross weight not over 7,000 pounds.

(b) Unslaked lime, quicklime, or calcium oxide, when offered for transportation by passenger-carrying aircraft, must be prepared for shipment in compliance with § 173.510 and must be packaged as follows:

(1) Earthenware, glass, metal, or plastic inside packagings, of not more than 5 pounds net capacity each. Inside packagings must be packed in strong outside packaging, containing not more than 25 pounds net weight.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53(e), App. A to Part 1)

[Amdt. 173-94, 41 FR 16088, Apr. 15, 1976, as amended by Amdt. 173-110, 42 FR 57967, Nov. 7, 1977; Amdt. 173-125, 43 FR 57897, Dec. 11, 1978; Amdt. 173-16, 48 FR 50461, Nov. 1, 1983]

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§ 173.860 Mercury, metallic.

(a) Except as limited by paragraphs (b) and (c) of this section, metallic mercury, when offered for transportation by aircraft, must be prepared for shipment in compliance with § 173.510 and must be packaged as follows:

(1) Earthenware, glass, or plastic inside packagings of not more than 5 pounds capacity each packed in strong outside packagings. Either the inside or the outside packaging must have complete enveloping inner linings or bags of strong, leak-tight, and puncture resistant material impervious to mercury.

(2) Iron or steel flasks packed in outside packagings. Either the inside or the outside packaging must have completely enveloping inner linings or bags of strong, leak-tight, and puncture resistant material impervious to mercury.

(b) Manufactured devices of which mercury is a component part (except tubes as described in paragraph (c) of this section) packed in outside packagings having completely enveloping inner linings or bags of strong, leak-tight, and puncture resistant material impervious to mercury, may be transported by aircraft if prepared for shipment in compliance with § 173.510.

(c) Electron tubes, vapor tubes, and similar tubes of which mercury is a component part, must be prepared for shipment in compliance with § 173.510 and must be packaged as follows:

(1) In outside packaging with all seams and joints sealed with self-adhesive, pressure-sensitive tape which will prevent the escape of mercury from the outside packagings; authorized only if the item contains not over one pound (454 grams) of mercury.

(2) In outside packaging having completely enveloping inner linings or bags of strong, leak-tight, and puncture resistant material impervious to mercury.

(3) In manufacturer's original packaging if each item does not contain more than 0.18-ounce (5 grams) of mercury per tube, and if the outside package does not contain more than 1.1 ounces (30 grams) total net quantity.

(4) In the manufacturer's original packagings if tubes are completely jacketed in sealed leak-tight metal cases.

(5) In manufacturer's original packaging if each item does not contain more than 100 milligrams of mercury per tube and if the outside package does not contain more than one gram total net quantity. Packages conforming to these quantity limitations are not subject to any other requirements of this subchapter.

[Amdt. 173-94, 41 FR 16088, Apr. 15, 1976, as amended by Amdt. 173-181, 49 FR 45750, Nov. 20, 1984; Amdt. 173-185, 50 FR 11055, Mar. 19, 1985]

§ 173.861 Gallium metal, liquid.

Gallium metal, liquid, when offered for transportation, must be packaged in earthenware, glass, or plastic inside packagings of not more than 5 pounds net capacity each packed in strong outside packagings. Either the inside or outside packagings must have complete enveloping linings or bags of strong, leak-tight, and puncture-resistant material impervious to liquid gallium metal.

[Amdt. 173-99, 41 FR 37115, Sept. 2, 1976]

§ 173.862 Gallium metal, solid.

Gallium metal, solid, when offered for transportation, must be packaged in glass or rigid plastic inside packagings of not more than 5 pounds net capacity each, enclosed in a sealed bag of strong, leak-tight, and puncture-resistant material impervious to liquid gallium. The sealed bag must be placed in a packaging constructed of wood, fiberboard, or plastic which is lined with a strong, leak-tight, and puncture-resistant material impervious to liquid gallium. This packaging must be enclosed in an outer packaging which contains dry ice or other means of refrigeration sufficient to maintain the gallium in a completely solid state during the entire anticipated time the gallium will be in transportation to its destination.

[Amdt. 173-99, 41 FR 37115, Sept. 2, 1976]

Subpart M—Other Regulated Material; ORM-C

SOURCE: Amdt. 173-94, 41 FR 16089, Apr. 15, 1976, unless otherwise noted.

§ 173.906 Inflatable life rafts, escape slides, and evacuation slides.

An inflatable life raft, escape slide or evacuation slide, serviced and ready for use as a life-saving appliance aboard a vessel or aircraft, containing small quantities of hazardous materials which are required as part of the life-saving appliance, including nonflammable compressed gas packaged in cylinders in accordance with this subchapter, Class C explosives that are pyrotechnic signal devices, and flammable liquids in repair kits, must be packed in a strong outside packaging.

[Amdt. 173-135, 45 FR 13090, Feb. 28, 1980]

§ 173.910 Ammonium sulfate nitrate.

(a) Ammonium sulfate nitrate, when offered for transportation by water, must be prepared for shipment in compliance with § 173.510 and must be packaged as follows:

(1) Steel barrel or drum;

(2) Wooden barrel or keg;

(3) Wooden box with inside packagings;

(4) Fiberboard box with inside packagings, not over 90 pounds gross weight;

(5) Fiber drum, not over 150 pounds gross weight; or

(6) Paper bag, not over 200 pounds net weight, moisture, and sift-proof, of strength not less than the equivalent of bags made of 8-ounce burlap.

§ 173.915 Battery parts.

Battery parts, when exhausted and unwashed, when offered for transportation by water, must be prepared for shipment in compliance with § 173.510 and must be packed in a metal or wooden barrel with sufficient absorbent material to absorb any liquid present in the parts.

§ 173.920 Bleaching powder.

(a) Bleaching powder (or chlorinated lime) containing less than 39 percent available chlorine, when offered for transportation by water, must be prepared for shipment in compliance with § 173.510 and must be packaged as follows:

(1) Steel barrel or drum;

(2) Wooden barrel or keg;

(3) Wooden or fiberboard box, with inside containers; or

(4) Fiber drum with inside metallic or polyethylene liner, not over 275 pounds gross weight.

§ 173.945 Calcium cyanamide, not hydrated.

(a) Calcium cyanamide, not hydrated, when offered for transportation by water, must be prepared for shipment in compliance with § 173.510 and must be packaged as follows:

(1) Steel barrel or drum; or

(2) Wooden barrel or keg:

(b) Calcium cyanamide, not hydrated, when offered for transportation by cargo aircraft only, must be prepared for shipment in compliance with §§ 173.510 and 173.154.

(c) Calcium cyanamide, not hydrated, when offered for transportation by passenger-carrying aircraft, must be prepared for shipment in compliance with § 173.510 and must be packed in earthenware, glass, metal, or plastic inside packagings of not over 1 pound each, adequately cushioned to prevent breakage and leakage. Inside packagings must be packed in a strong outside package containing not more than 25 pounds each.

[Amdt. 173-94, 41 FR 16089, Apr. 15, 1976, as amended by Amdt. 173-16, 48 FR 50461, Nov. 1, 1983]

§ 173.952 Castor beans and castor pomace.

(a) Castor beans and castor pomace, when offered for transportation by water, must be prepared for shipment in compliance with § 173.510 and must be packaged as follows:

(1) Sift-proof, five-ply paper bag, not over 100 pounds net weight.

(2) Sift-proof, paper or plastic lined burlap bag, not over 100 pounds net weight.

(3) Sift-proof, paper or plastic lined cotton bag, not over 100 pounds net weight.

§ 173.955 Coconut meal pellets.

(a) Coconut meal pellets which contain at least 6 percent water, when offered for transportation by water, must be prepared for shipment in compliance with § 173.510 and must be packaged as follows:

(1) Burlap (jute) bag;

(2) Multi-wall paper bag; or

(3) Polyethylene-lined burlap or paper bag.

§ 173.960 Copra.

Copra, when offered for transportation by water, must be prepared for shipment in compliance with § 173.510 and must be packaged in a burlap bag.

§ 173.985 Exothermic ferrochrome, ferromanganese, and silicon-chrome.

Exothermic ferrochrome, ferromanganese, and silicon-chrome, when offered for transportation by water, must be prepared for shipment in compliance with § 173.510 and must be packaged in a steel barrel or drum, not over 750 pounds gross weight.

§ 173.995 Fish scrap and fish meal.

(a) Except as provided in paragraph (b) of this section, fish scrap and fish meal, containing at least 6 percent but not more than 12 percent water, when offered for transportation by water, must be prepared for shipment in compliance with § 173.510 and must be packaged as follows:

(1) Burlap (jute) bag;

(2) Multi-wall paper bag;

(3) Polyethylene-lined burlap or paper bag;

(4) Rail car; or

(5) Freight container.

(b) Fish scrap and fish meal may not be offered for transportation if the temperature of the material exceeds 120° F. (49° C.)

(c) When fish scrap or fish meal is offered for transportation by vessel in bulk in freight containers the following additional requirements must be met:

(1) The fish meal must contain at least 100 PPM antioxidant (ethoxyquin) at the time of shipment.

(2) Each shipment must be accompanied by a statement in which the shipper certifies:

(i) The moisture content of the fish meal;

(ii) The concentration of antioxidant (ethoxyquin) in the material in PPM at the time of loading into the freight container;

(iii) The fat content of the fish meal;

(iv) Date and place of production of the fish meal; and

(v) The physical state of the material (ground, pelletized, or mixture).

[Amdt. 173-94, 41 FR 16089, Apr. 15, 1976, as amended by Amdt. 173-116, 43 FR 17945, Apr. 27, 1978]

§ 173.1010 Lead dross or scrap containing 3 percent or more free acid.

Lead dross or scrap containing 3 percent or more free acid, when offered for transportation by water, must be prepared for shipment in compliance with § 173.510 and must be packaged in steel barrels or drums or wooden barrels, boxes, or kegs.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 173-130, 44 FR 23228, Apr. 19, 1979]

§ 173.1015 Lithium batteries, for disposal.

(a) Lithium batteries, for disposal, comprised of one or more cells, may be offered for transportation to a permitted storage facility and disposal site by motor vehicle only, if the battery:

(1) When new, contained not more than 12 grams of lithium per cell;

(2) Is equipped with an effective means of preventing external short circuits;

(3) Is classified and offered for transportation as an ORM-C; and

(4) Is overpacked in a strong fiberboard box, or metal or fiber drum which complies with § 173.24.

(b) Paragraph (a) does not apply to lithium batteries which, when new, were excepted from regulation under § 173.206(f).

[Amdt. 173-160, 47 FR 54827, Dec. 6, 1982; 48 FR 655, Jan. 6, 1983]

§ 173.1020 Magnetized material.

(a) For the purpose of this subchapter, a substance is considered to be a magnetized material if, when packaged for transportation by air, it has a magnetic field strength of 0.002 gauss or more at a distance of 7 feet, from any point on the surface of the package, or which is of such mass that it could affect the aircraft instruments, particularly the compasses. When offered for transportation by air, magnetized material must be packaged as follows:

(1) Devices, such as magnetrons and light meters, must be packed so that the polarities of each unit oppose one another.

(2) Permanent magnets must have keeper bars installed, must be shielded, or the shipper specifically may arrange with the carrier for special stowage to prevent the magnetic field from causing compass deviation.

(3) Each package containing magnetized material must be marked "ORM-C", and bear the label described in § 172.446 of this subchapter.

(b) Any package which has a measurable magnetic field greater than 0.00525 gauss, when measured from any surface at a distance of 15 feet, must be shielded to reduce the reading to not greater than 0.00525 gauss before offering for shipment by air.

(c) For loading magnetized material aboard aircraft, see § 175.85 of this subchapter.

§ 173.1025 Ferrous metal borings, shavings, turnings, or cuttings (excluding stainless steel).

Ferrous metal borings, shavings turnings, or cuttings, other than stainless steel, when offered for transportation by water, must be prepared for shipment in compliance with § 173.510 and must be packaged in a metal barrel or drum.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 173-130, 44 FR 23228, Apr. 19, 1979]

§ 173.1040 Pesticide, water-reactive.

Water reactive pesticide not otherwise subject to this subchapter, and including fungicides, herbicides, etc., which contain manganese ethylene bis-dithio carbamate, when offered for transportation by water, must be packaged in water resistant packaging in compliance with § 173.510.

§ 173.1045 Petroleum coke, uncalcined.

Uncalcined petroleum coke, when offered for transportation by water, must be prepared for shipment in compliance with § 173.510 and must be packaged in metal barrels or drums.

§ 173.1065 Rubber curing compound, solid.

(a) Solid rubber curing compounds, when offered for transportation by water, must be prepared for shipment in compliance with § 173.510 and must be packaged as follows:

(1) Metal barrel or drum;
(2) Fiber drum;
(3) Wooden barrel or keg;
(4) Wooden or fiberboard box;
(5) Sift-proof multi-wall paper bag; or
(6) Sift-proof lined burlap bag.

§ 173.1070 Sawdust or wood shavings.

(a) Sawdust or wood shavings, when offered for transportation by water, must be prepared for shipment in compliance with § 173.510 and must be packaged as follows:

(1) Steel barrel or drum;
(2) Wooden barrel or keg;
(3) Wooden or fiberboard box;
(4) Bag; or
(5) Bales, slatted and compactly bound with wire or metal bands.

§ 173.1080 Sulfur.

(a) Sulfur, flowers of sulfur (sulfur flower), when offered for transportation by water, must be prepared for shipment in compliance with § 173.510 and must be packaged as follows:

(1) Metal barrel or drum;
(2) Wooden barrel or keg;
(3) Wooden or fiberboard box;
(4) Sift-proof multi-wall paper bag;
(5) Sift-proof paper-lined burlap bag;
(6) Sift-proof rail car; or
(7) Sift-proof or lined freight container.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 173-94, 41 FR 16089, Apr. 15, 1976, as amended by Amdt. 173-131, 44 FR 49458, Aug. 23, 1979; Amdt. 173-142, 45 FR 81572, Dec. 11, 1980]

§ 173.1090 Asbestos.

(a) Asbestos includes any of the following hydrated mineral silicates:

chrysotile, crocidolite, amosite, anthophyllite asbestos, tremolite asbestos, actinolite asbestos, and every product containing any of these minerals.

(b) Commercial asbestos is any material or product containing asbestos that has commercial value because of its asbestos content.

(c) Asbestos which is immersed or fixed in a natural or artificial binder material (such as cement, plastic, asphalt, resins or mineral ore) and manufactured products containing asbestos or any materials or products whose commercial value is not dependent on their asbestos content, are not subject to the requirements of this subchapter.

(d) Commercial asbestos must be offered for transportation and transported in:

(1) Rigid, leaktight packagings, such as metal or fiber drums, portable tanks, hopper-type rail cars, or hopper-type motor vehicles;

(2) Bags or other non-rigid packagings in closed freight containers, motor vehicles, or rail cars that are loaded by and for the exclusive use of the consignor and unloaded by the consignee;

(3) Bags or other non-rigid packagings which are dust and sift-proof. When transported by other than private carrier by highway, such packagings containing asbestos must be palletized and unitized by methods such as shrink-wrapping in plastic film or wrapping in fiberboard secured by strapping. Pallets need not be used during transportation by vessel for loads with slings that are unitized by methods such as shrink-wrapping, if the slings adequately and evenly support the loads and the unitizing method prevents shifting of the bags or other non-rigid packagings during conditions normally incident to transportation; or

(4) Bags or other non-rigid packagings which are dust and sift-proof in strong outside fiberboard or wooden boxes.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 173-123, 43 FR 56668, Dec. 4, 1978, as amended at 44 FR 18674, Mar. 29, 1979; 44 FR 47938, Aug. 16, 1979; Amdt. 173-158, 47 FR 43066, Sept. 30, 1982]

Subpart N—Other Regulated Material; ORM-D

§ 173.1200 Consumer Commodity.

(a) In order to be transported under the proper shipping name of "Consumer commodity," a material must meet that definition. It may be reclassed and offered for shipment as ORM-D material (see § 173.500) provided that an ORM-D exception is authorized in specific sections applicable to the material, and that it is prepared in accordance with the following paragraphs. (The gross weight of each package must not exceed 65 pounds and each package offered for transportation aboard aircraft must meet the requirements of § 173.6.)

(1) *Flammable Liquids must be:* (i) In inside metal containers, each having a rated capacity of 1 quart or less, packed in strong outside packagings.

(ii) In inside containers, each having a rated capacity of 1 pint or less, packed in strong outside packagings.

(iii) In inside containers, each having a rated capacity of one gallon or less, packed in strong outside packagings. The provisions of this exception apply only if the flash point of the material is 73° F. or higher.

(2) *Corrosive liquids must be:* (i) In bottles, each having a rated capacity of 1 pint or less, each enclosed in a metal can, packed in strong outside packagings.

(ii) In metal or plastic containers, each having a rated capacity of 1 pint or less, packed in strong outside packagings.

(iii) In metal or plastic inside containers, each having a rated capacity of not over 1 quart, packed in strong outside packaging provided the liquid mixture contains 15 percent or less corrosive material and the remainder of the mixture does not meet the definition of a hazardous material as defined in this subchapter. Not authorized for transportation by air.

(3) *Corrosive solids* must be: (i) In earthenware, glass, plastic or paper containers each having a net weight of 5 pounds or less, packed in strong metal, wooden, or fiberboard outside

packagings, each having a net weight of 25 pounds or less.

(ii) In metal, rigid fiber, or composition cans or cartons or rigid plastic containers each having a net weight of 10 pounds or less, packed in strong outside packagings each having a net weight of 25 pounds or less.

(iii) In metal, rigid fiber, or composition cans or cartons or rigid plastic containers, each having a rated capacity of not over 20 pounds, overpacked in metal, wooden or fiberboard outside containers not exceeding 50 pounds net weight provided the solid mixture contains 10 percent or less corrosive material and the remainder of the mixture does not meet the definition of a hazardous material as defined in this subchapter.

(4) *Flammable solids* except for charcoal briquettes must be in inside containers each having a net weight of 1 pound or less, packed in strong outside packagings each having a net weight of 25 pounds or less. Charcoal briquettes may be shipped in packagings having a net weight of 65 pounds or less.

(5) *Oxidizers* must be in inside containers each having a rated capacity of 1 pint or less for liquids or a net weight of 1 pound or less for solids, packed in strong outside packaging each having a net weight of 25 pounds or less.

(6) *Organic peroxides* must be: (i) In inside containers which must be securely packed and cushioned with noncombustible cushioning material in strong outside packagings containing not over 1 pint or 1 pound net quantity of the materials. Cushioning is not required when the liquid is contained in strong, securely closed, plastic packagings, not over 1 ounce capacity each, properly packed to prevent leakage or breakage.

(ii) In strong outside packagings of 24 or less inside fiberboard containers, each having 70 or less securely closed tubes having a maximum fluid capacity of ⅙-ounce each and securely packed in noncombustible cushioning material. Each fiberboard container may not contain more than 1 pint of liquid.

(7) *Poison B liquids or solids* must be in inside containers, each having a rated capacity of 8 ounces or less by volume for liquids or of 8-ounces or less net weight for solids packed in strong outside packagings.

(8) *Compressed gases* must be: (i) In inside containers, each having a water capacity of 4-fluid ounces or less (7.22 cubic inches or less), packed in strong outside packagings.

(ii) In inside metal container charged with a solution of materials and compressed gas or gases which is nonpoisonous, meeting all of the following:

(A) Capacity may not exceed 50 cubic inches (27.7 fluid ounces);

(B) Pressure in the container may not exceed 180 p.s.i.g. at 130° F. (55° C.). If the pressure exceeds 140 p.s.i.g. at 130° F., (55° C.) but does not exceed 160 p.s.i.g. at 130° F., (55° C.) a specification DOT 2P (§ 178.33 of this subchapter) inside metal container must be used; if the pressure exceeds 160 p.s.i.g. at 130° F., (55° C.), a specification DOT 2Q (§ 178.33a of this subchapter) inside metal container must be used. In any event the metal container must be capable of withstanding, without bursting, a pressure of one and one-half times the equilibrium pressure of the contents at 130° F. (55° C.);

(C) Liquid content of the material and gas not completely fill the container at 130° F. (55° C.);

(D) The containers must be packed in strong outside packagings; and

(E) Each completed container filled for shipment must have been heated until the pressure in the container is equivalent to the equilibrium pressure of the content at 130° F. (55° C.) without evidence of leakage, distortion, or other defect.

(iii) In a non-refillable inside metal container of 50 cubic-inch capacity or less (27.7 fluid ounces), with foodstuffs or soaps and with soluble or emulsified compressed gas, provided the pressure in the container does not exceed 140 p.s.i.g. at 130° F. (55° C.). The metal container must be capable of withstanding, without bursting, a pressure of one and one-half times the equilibrium pressure of the contents at 130° F. (55° C.) and must comply with the following provisions:

(A) Containers must be packed in strong outside packagings, and

(B) Liquid content of the material and gas may not completely fill the container at 130° F. (55° C.).

(iv) In refillable inside metal containers with cream and soluble or emulsified compressed gas packed in strong outside packagings. Containers must be of such design that they will hold pressure without permanent deformation up to 375 p.s.i.g. and must be equipped with a device designed so as to release pressure without bursting of the container or dangerous projection of its parts at higher pressures.

(v) In non-refillable inside metal containers charged with a solution, containing biological products or a medical preparation which could be deteriorated by heat, and compressed gas or gases which is nonpoisonous and nonflammable. The capacity of each container may not exceed 35 cubic inches (19.3 fluid ounces). The pressure in the container may not exceed 140 p.s.i.g. at 130° F. (55° C.), and the liquid content of the product and gas may not completely fill the container at 130° F. (55° C.). One completed container out of each lot of 500 or less, filled for shipment, must be heated, until the pressure in the container is equivalent to the equilibrium pressure of the content at 130° F. (55° C.). There may be no evidence of leakage, distortion, or other defect. Container must be packed in strong outside packagings.

(vi) In electronic tubes, each having a volume of not more than 30 cubic inches and charged with gas to a pressure of not more than 35 p.s.i.g. and packed in strong outside packagings.

(vii) In an inside metal container as a component of an audible fire alarm system powered by a compressed gas meeting the following provisions:

(A) Each inside container must have contents which are not flammable, poisonous, or corrosive as defined under this part;

(B) Each inside container may not have a capacity exceeding 35 cubic inches (19.3 fluid ounces);

(C) Each inside container may not have a pressure exceeding 70 p.s.i.g. at 70° F. (21° C.) and the liquid portion of the gas may not completely fill the inside container at 130° F. (55° C.);

(D) Each inside container must be designed and fabricated with a burst pressure of not less than five times its charged pressure at 130° F. (55° C.); and

(E) Each fire alarm system must be packed in a strong outside packaging.

[Amdt. 173-94, 41 FR 16091, Apr. 15, 1976, as amended by Amdt. 173-94A, 41 FR 40684, Sept. 20, 1976; Amdt. 173-94B, 41 FR 57070, Dec. 30, 1976]

§ 173.1201 Small arms ammunition.

(a) Small arms ammunition which has been classed as a Class C explosive may be re-classed and offered for transportation as ORM-D material (See § 173.500 of this part) if it is packaged in accordance with paragraph (b) of this section. Small arms ammunition that may be shipped as ORM-D is limited to:

(1) Ammunition for rifle, pistol, or shotgun;

(2) Ammunition with inert projectiles or blank ammunition;

(3) Ammunition having no tear gas, incendiary, or detonating explosive projectiles; and

(4) Ammunition not exceeding 50 caliber for rifle or pistol cartridges or 8 gauge for shotshells.

(b) Packaging for small arms ammunition as ORM-D must be as follows:

(1) Ammunition must be packed in inside boxes, or in partitions which fit snugly in the outside packaging or in metal clips;

(2) Primers must be protected from accidental initiation;

(3) Inside boxes, partitions or metal clips must be packed in securely closed strong outside packagings; and

(4) Maximum gross weight is limited to 65 pounds per package.

(49 U.S.C. 1803, 1804, 49 CFR 1.53, App. A to Part 1)

[Amdt. 173-175, 49 FR 21936, May 24, 1984]

Subpart O—Other Regulated Material; ORM-E

§ 173.1300 Hazardous waste, liquid or solid, n.o.s.; hazardous substance, liquid or solid, n.o.s.

Hazardous waste, liquid or solid, n.o.s., or Hazardous substance, liquid or solid, n.o.s., may not be offered for transportation unless packaged in accordance with § 173.510.

[Amdt. 173-137, 45 FR 34704, May 22, 1980]

APPENDIX A—METHOD OF TESTING CORROSION TO SKIN

1. Corrosion to the skin is measured by patch-test technique on the intact skin of the albino rabbit, clipped free of hair. A minimum of six subjects are to be used in this test.

2. Introduce under a square cloth patch, such as surgical gauze measuring not less than 1 inch by 1 inch and two single layers thick, 0.5 milliliter (in the case of liquids) or 0.5 gram (in the case of solids and semisolids) of the substance to be tested.

3. Immobilize the animals with patches secured in place by adhesive tape.

4. Wrap the entire trunk of each animal with an impervious material, such as rubberized cloth, for the 4 hour period of exposure. This material is to aid in maintaining the test patches in position and retards the evaporation of volatile substances. It is not applied for the purpose of occlusion.

5. After 4 hours of exposure, the patches are to be removed and the resulting reactions are to be evaluated for corrosion.

6. Following this initial reading, all test sites are washed with an appropriate solvent to prevent further exposure.

7. Readings are again to be made at least at the end of a total of 48 hours (44 hours after the first reading).

8. Corrosion will be considered to have resulted if the substances in contact with the rabbit skin have caused destruction or irreversible alteration of the tissue on at least two out of each six rabbits tested. Tissue destruction is considered to have occurred if, at any of the readings, there is ulceration or necrosis. Tissue destruction does not include merely sloughing of the epidermis, or erythema, edema, or fissuring.

[Amdt. 173-94, 41 FR 16092, Apr. 15, 1976, as amended by Amdt. 173-94A, 41 FR 40684, Sept. 20, 1976; Amdt. 173-94B, 41 FR 57070, Dec. 30, 1976; Amdt. 173-149, 46 FR 49906, Oct. 8, 1981]

APPENDIX B—PROCEDURE FOR TESTING CHEMICAL COMPATIBILITY AND RATE OF PERMEATION IN POLYETHYLENE PACKAGING AND RECEPTACLES

1. The purpose of this procedure is to determine the chemical compatibility and permeability of liquid hazardous materials packaged in polyethylene packaging and receptacles. Alternatives for this procedure are permitted as specified in § 173.24(d)(3) of this subchapter.

2. Compatibility and rate of permeation are determined by subjecting full size polyethylene containers (or smaller containers as permitted in paragraph 4 of this Appendix) and hazardous material lading to one of the following combinations of time and temperature:

a. Test Method 1: 180 days at a temperature no lower than 18°C. (64°F.)

b. Test Method 2: 28 days at a temperature no lower than 50°C. (122°F.)

c. Test Method 3: 14 days at a temperature no lower than 60°C. (140°F.)

3. Regardless of which test method is used, at least three sample containers shall be tested for each combination of hazardous material and size and design of container. Fill containers to rated capacity with the specific hazardous material (at the concentration to be transported) and close as for shipment. For the first and last 24 hours of storage under the selected test method, place the containers with closures downward, except that containers fitted with a vent are so placed on each occasion for five minutes only.

4. For testing under Test Method 2 or 3 in those instances where it is not practicable to use full size containers, smaller containers may be used. The small container shall be manufactured by the same process as the larger container (for example, using the same method of molding and processing temperatures) and be made of identical resins, pigments and additives.

5. Determine filled container weight or net weight of contents both before and after storage under the selected test method. Rate of permeation is determined from loss of hazardous materials contents, during the conduct of the test, expressed as a percentage of the original weight.

6. After storage under the selected test method, the container shall be drained, rinsed, filled to rated capacity with water and, with filled container at ambient temperature, dropped from a height of 1.2 meters (3.94 feet) onto solid concrete.

7. Each of the following constitute test failure:

a. Visible evidence of permanent deformation due to vapor pressure build-up or collapse of walls, deterioration, swelling, craz-

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ing, cracking, excessive corrosion, oxidization, embrittlement, leakage, rupture or other defects likely to cause premature failure or a hazardous condition.

b. For materials meeting the definition of a poison according to this subchapter, a rate of permeation in excess of 0.5% determined over the test period. For all other hazardous materials, a rate of permeation in excess of 2.0% determined over the test period.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 173-176, 49 FR 24691, June 14, 1984]

PART 174—CARRIAGE BY RAIL

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AUTHORITY: 49 U.S.C. 1803, 1804, 1808, 49 CFR 1.53(e), unless otherwise noted.

SOURCE: Amdt. 174-26, 41 FR 16092, Apr. 15, 1976, unless otherwise noted.

EDITORIAL NOTE: For nomenclature changes to Part 174, see 50 FR 45731, Nov. 1, 1985.

Subpart A—General Requirements

§ 174.1 Purpose and scope.

This part prescribes requirements in addition to those contained in Parts 171, 172, 173, and 179 of this subchapter, to to be observed with respect to the transportation of hazardous materials in or on rail cars.

[Amdt. 174-26, 41 FR 16092, Apr. 15, 1976, as amended by Amdt. 174-26A, 41 FR 40685, Sept. 20, 1976]

§ 174.3 Unacceptable hazardous materials shipments.

A shipment of a hazardous material that is not prepared for transportation in accordance with Parts 171, 172 and 173 of this subchapter may not be accepted for transportation or transported by rail except as provided in § 174.47(b).

[Amdt. 174-26, 41 FR 16092, Apr. 15, 1976, as amended by Amdt. 174-26A, 41 FR 40685, Sept. 20, 1976]

§ 174.5 Carrier's materials and supplies.

This subchapter applies to the transportation of a carrier's materials and supplies moving by rail, except that the shipper's certification is not required when these materials and supplies are being transported by the carrier who owns them. The requirements of this subchapter do not apply to railway torpedoes or fusees when carried in engines or rail cars. Railway torpedoes must be in closed metal boxes when not in use.

[Amdt. 174-26B, 41 FR 57071, Dec. 30, 1976]

§ 174.7 Responsibility for compliance.

Unless this subchapter specifically provides that another person is to perform a particular duty, each carrier, including a connecting carrier, shall perform the duties specified and comply with each applicable requirement of this part, and shall instruct its employees in relation thereto.

§ 174.8 Inspection.

(a) Methods of manufacture, packing, and storage of hazardous material, insofar as they affect safety in transportation by rail, must be open to inspection by a duly authorized representative of the Department, an initial carrier, and the Bureau of Explosives.

(b) At any point where a train is required to be inspected, each loaded placarded rail car and each rail car immediately adjacent thereto must be inspected. The cars may continue in transit only when the inspection indicates that the cars are in a safe condition for transportation. (See §§ 174.9 and 174.10.) The inspection of a rail car other than a tank car or a rail car containing Class A explosives must include a visual inspection for obvious defects of the running gear and any leakage of contents from the car and to determine whether all required placards are in place and conform to the information given on the train consist or other shipping document as required by § 174.26(b).

(c) For inspection requirements applicable to rail cars containing Class A explosives, see §§ 174.10 and 174.104.

[Amdt. 174-26, 41 FR 16092, Apr. 15, 1976, as amended by Amdt. 174-26A, 41 FR 40685, Sept. 20, 1976; Amdt. 174-26B, 41 FR 57071, Dec. 30, 1976]

§ 174.9 Inspection of tank cars.

(a) Each loaded placarded tank car must be inspected by the carrier before acceptance at the originating point and when received in interchange to see that it is not leaking and that the air and hand brakes, journal boxes, and trucks are in proper condition for service.

(b) An empty tank car which previously contained a hazardous material and which is tendered for movement or received in interchange must have all manhole covers, outlet valve reducers, outlet valve caps, outlet valve cap plugs, end plugs, and plugs or caps or other openings securely in their proper places, except that heater coil inlet and outlet pipes must be left open for drainage.

(c) The safety valves on a tank car may not be tested while the car is loaded. Whenever a test of the safety valves or tank becomes due while a loaded car is in transit, unless the car is leaking or in a manifestly insecure condition, it must be forwarded to its destination, carded on each side with a card exhibiting the following notice:

Safety valves overdue for test:
Tank overdue for test:
Moving under authority of 49 CFR 174.9(c).

A prompt report of each such movement, showing the identifying initials and number of each car, must be made to the Bureau of Explosives by the carrier carding the cars.

§ 174.10 Inspection of cars at interchange.

(a) Each rail car containing explosives requiring EXPLOSIVES A placards (see § 174.104) which is offered by a connecting line must be visually inspected externally by the receiving line. If practicable, the receiving carrier should also inspect the lading. The car may not be forwarded until all discovered violations have been corrected.

(b) If the car shows evidence of or if there is any reason to suspect that it has received rough treatment, the lading must be inspected and placed in proper condition before the car is permitted to proceed. When interchange occurs and the inspection is performed after daylight hours, electric flashlights should be used and naked lights may not be used.

(c) A shipment of hazardous materials offered by a connecting carrier must comply with this subchapter, and the revenue waybill, freight bill, manifest of lading, card waybill, switching order, transfer slip ticket, or other billing, must bear the placard notation and endorsement prescribed by § 174.25 of this subpart.

(d) A car containing packages of hazardous materials other than explosives may not be offered in interchange if the packages are in a leaking condition.

(e) In the case of a tank car which has developed small leaks in the course of its movement to an interchange point and which requires a short movement to effect delivery for unloading by the consignee, the movement may be made if it can be made safely adhering to the precautions prescribed by § 174.50.

[Amdt. 174-26, 41 FR 16092, Apr. 15, 1976, as amended by Amdt. 174-26B, 41 FR 57071, Dec. 30, 1976]

§ 174.11 Canadian shipments and packagings.

A Canadian shipment or package may be transported by rail car within the United States if it is in compliance with the requirements of this subchapter or the TDG Regulations and the regulations of the Canadian Transport Commission as provided in § 171.12a of this subchapter.

[Amdt. 174-48, 50 FR 41521, Oct. 11, 1985]

§ 174.12 Intermediate shippers and carriers.

(a) Each origin carrier, including a freight forwarder, must have on file a copy of the shipper's certified shipping paper, as prescribed in Part 172 of this subchapter, for each shipment of hazardous materials it handles. An intermediate shipper or carrier may not forward or transport a shipment of hazardous materials if it does not meet the requirements of this subchapter.

(b) An intermediate carrier offering or delivering for transportation any loaded motor vehicle, trailer, semitrailer, or container containing any hazardous material must show on the shipping paper the information required by § 172.201 of this subchapter and a description of the type vehicle or container.

[Amdt. 174-26, 41 FR 16092, Apr. 15, 1976, as amended by Amdt. 174-26B, 41 FR 57071, Dec. 30, 1976]

§ 174.14 Movements to be expedited.

(a) A carrier must forward each shipment of hazardous materials promptly and within 48 hours (Saturdays, Sundays, and holidays excluded), after acceptance at the originating point or receipt at any yard, transfer station, or interchange point, except that where biweekly or weekly service only is performed, a shipment of hazardous materials must be forwarded on the first available train.

(b) A tank car loaded with any flammable liquid or gas, or a poison gas, may not be received and held at any point, subject to forwarding orders, so as to defeat the purpose of this section or of § 174.204 of this subchapter.

§ 174.16 Removal and disposition of hazardous materials at destination.

(a) *Delivery at non-agency stations.* A shipment of explosives may not be unloaded at non-agency stations unless the consignee is there to receive it or unless properly locked and secure storage facilities are provided at that point for its protection. If delivery cannot be so made, the shipment must be taken to next or nearest agency station for delivery.

(b) *Delivery at agency stations.* A carrier shall require the consignee of each shipment of hazardous materials to remove the shipment from carrier's property within 48 hours (exclusive of Saturdays, Sundays, and holidays) after notice of arrival has been sent or given. If not so removed, the carrier shall immediately dispose of the shipments as follows:

(1) *Class A explosives:* If safe storage is available, by storage at the owner's expense; if safe storage is not available, by return to the shipper, sale, or destruction under supervision of a competent person; or if safety requires, by destruction under supervision of a competent person.

(2) *Hazardous materials, except Class A explosives, in carload shipments:* By storage on the carrier's property; by storage on other then the carrier's property, if safe storage on the carrier's property is not available; or by sale at expiration of 15 calendar days after notice of arrival has been sent or given to the consignee, provided the consignor has been notified of the non-delivery at the expiration of a 48-hour period and orders for disposition have not been received.

(3) *Hazardous materials, except Class A explosives, in less-than-carload shipments:* By return to the shipper if notice of non-delivery was requested and given the consignor as prescribed by the carrier's tariff, and orders for return to shipper have been received; by storage on the carrier's property; by storage on other than the carrier's property, if safe storage on carrier's property is not available; or by sale at expiration of 15 calendar days after notice of arrival has been sent or given to the consignee, provided the consignor has been notified of non-delivery at expiration of a 48-hour period and orders for disposition have not been received.

§ 174.18 Astray shipments.

An astray package of hazardous materials other than explosives, of known destination and in proper condition for safe transportation, must be forwarded immediately on an "astray bill", showing the information required by Subpart C of Part 172 of this subchapter. When necessary to replace a label and doubt exists as to the kind, the FLAMMABLE LIQUID label must be applied. For astray shipments of explosives, see § 174.103.

§ 174.20 Local or carrier restrictions.

(a) When local conditions make the acceptance, transportation, or delivery of hazardous materials unusually hazardous, local restrictions may be imposed by the carrier.

(b) Each carrier must report to the Bureau of Explosives for publication the full information as to any restrictions which it imposes against the acceptance, delivery, or transportation of hazardous materials, over any portion of its lines under this section.

Subpart B—General Operating Requirements

§ 174.24 Shipping papers.

(a) Except as provided in paragraph (b) of this section, no person may accept for transportation by rail any hazardous material which is subject to this subchapter unless he has received a shipping paper prepared in the manner specified in Subpart C of Part 172 of this subchapter. In addition, the shipping paper must include a certificate, if required by § 172.204 of this subchapter. However, no member of the train crew of a train transporting the hazardous material is required to have a shipper's certificate on the shipping paper in his possession if the original shipping paper containing the certificate is in the originating carrier's possession.

(b) This subpart does not apply to a material classed as an ORM-A, B, C, or D unless it is a:

(1) Hazardous substance, or

(2) Hazardous waste.

[Amdt. 174-28, 41 FR 16062, Apr. 15, 1976, as amended by Amdt. 174-137, 45 FR 34704, May 22, 1980]

§ 174.25 Additional information on waybills, switching orders and other billings.

(a) Each waybill, switching ticket, switching order or other billing used in place thereof, prepared by the carrier from bills-of-lading, shipping orders or other shipping papers, and each shipping order used as a waybill for a rail car required to be placarded by Subpart F of Part 172 of this subchapter must, in addition to containing the information required by §§ 172.202 and 172.203 of this subchapter, be plainly marked by the carrier with:

(1) In the case of a flatcar carrying trailers or containers, an indication of which trailers or containers contain the hazardous materials; and

(2) The placard endorsement specified in the following table for the hazardous material or class concerned near the space on the face of the billing provided for the car number:

(i) In letters not less than ⅜ of an inch, or

(ii) In bold, uppercase letters not less than 5/16 of an inch high inside a rectangle made with any symbol such as asterisk (*), dollar sign ($), capital (X), or the symbol for number (#).

Hazardous material or class	Placard notation	Placard endorsement
Explosives, class A	Placarded EXPLOSIVES A	Explosives.
Explosive chemical ammunition containing class A poison.	Placarded EXPLOSIVES A and POISON GAS	Explosives and poison gas.
Explosives, class B	Placarded EXPLOSIVES B	Dangerous.
Explosives, class C	Placarded DANGEROUS	Do.
Blasting agent	Placard BLASTING AGENTS	Do.
Flammable liquids	Placarded FLAMMABLE	Do.
Flammable solids	Placarded FLAMMABLE SOLID	Do.
Oxidizer	Placarded OXIDIZER	Do.
Corrosive material	Placarded CORROSIVE	Do.
Nonflammable gases	Placarded NON-FLAMMABLE GAS	Do.
Flammable gases	Placarded FLAMMABLE GAS	Do.
Poisonous gases or liquids, class A	Placarded POISON GAS	Poison gas.
Poison, class B	Placarded POISON	Dangerous.
Radioactive material (Yellow-III label only)	Placarded RADIOACTIVE	Radioactive material.
Organic peroxide	Placarded ORGANIC PEROXIDE	Dangerous.
Irritating material	Placarded DANGEROUS	Do.
Combustible liquid	Placarded COMBUSTIBLE	None.
Chlorine	Placarded CHLORINE	Dangerous.
Fluorine	Placarded POISON	Do.
Oxygen, cryogenic liquid	Placarded OXYGEN	Do.
Empty tank cars last containing a hazardous material other than a combustible liquid	See sec. 174.25(c)	Do.

(b) When the initial movement of a loaded rail car required to be placarded is a switching operation, the switching order, switching receipt, or switching ticket, and all copies thereof, prepared by the shipper, or by the carrier under the shipper's written authority, must contain the following:

(1) The shipping description consisting of:

(i) The proper shipping name specified for the material in § 172.101 or § 172.102 (when authorized) of this subchapter;

(ii) The hazardous class specified for the material in the same Table;

(iii) The identification number (preceded by "UN" or "NA" as appropriate) prescribed for the material in the same Table; and

(iv) The total quantity (by weight, volume, or as otherwise appropriate) of the hazardous material covered by the description.

(2) Except when a certified bill of lading is tendered to the carrier, the shipper's certification and signature specified in § 172.204 of this subchapter.

(3) The placard notation specified in the Table in § 174.25(a).

(4) For any entry for a material that is a hazardous substance, the letters "RQ" entered either before or after the basic description.

(c) For an empty tank car that previously contained a hazardous material, other than combustible liquid, or unless the tank car has been reloaded with a material not subject to this subchapter, or has been sufficiently cleaned of residue and purged of vapor to remove any potential hazard, the billing must show the word(s) "EMPTY" or "EMPTY: Last Contained" followed by the basic description of the hazardous material last contained in the tank car, and the word, "Placarded." For example, "EMPTY: Sulfuric acid, Corrosive material, UN1830, Placarded:" or "EMPTY: Last Contained Sulfuric acid, Corrosive material, UN1830, Placarded". For an empty tank car that last contained a hazardous substance and still contains a reportable quantity, the letters "RQ" shall be entered on the billing either before or after the basic description.

(d) At each station, or other point, where any other shipment of material is loaded into a properly certified and placarded rail car containing a shipment of Explosives A, and when a shipment of Explosives A, is transferred or reloaded, or a carload shipment of Explosives A, is reconsigned, the carrier must make a record of the car, originating point, carrier's name and date of car certificate. In addition, the blocking and bracing must be inspected as required in § 174.104 and certified as being in compliance with the requirements of this part by the person making the inspection who shall sign the car certificates immediately below the signature which appears on Certificate Number 2 of the original car certificates attached to the car.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 174-26, 41 FR 16092, Apr. 15, 1976]

EDITORIAL NOTE: For Federal Register citations affecting § 174.25, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

EFFECTIVE DATE NOTE: Section 174.25 was amended at 50 FR 39008, Sept. 25, 1985, by revising paragraph (c), effective October 1, 1986. The text of paragraph (c) effective October 1, 1986, is set forth below. Paragraph (c) was correctly revised at 50 FR 46054, Nov. 6, 1985.

§ 174.25 Additional information on waybills, switching orders and other billings.

* * * * *

(c) For a tank car that contains only the residue of a hazardous material, other than a combustible liquid, the shipping papers must contain the words "RESIDUE: Last Contained * * *", the basic description of the hazardous material last contained in the tank car and the placard notation specified in the second column of the table in paragraph (a)(2) of this section followed by the word RESIDUE. For example, "RESIDUE: Last Contained Sulfuric acid, Corrosive material, UN1830, Placarded: CORROSIVE-RESIDUE". For a tank car that contains a residue that is a hazardous substance, the letters "RQ" must also be entered on the shipping paper either before or after the basic description.

* * * * *

§ 174.26 Notice to train crews of placarded cars.

(a) At each terminal or other place where trains are made up or switched by crews other than train crews accompanying the outbound movement of cars, the carrier shall execute consecutively numbered notices showing the location in each train of each rail car placarded EXPLOSIVE A or POISON GAS. A copy of each notice must be delivered to the train and engine crew concerned, and a copy thereof showing delivery to the train and engine crew must be kept on file by the carrier at each point where the notice is given. At points where train or engine crews are changed, the notice must be transferred from crew to crew. See paragraph (b) of this section for other placarded cars.

(b) The train crew must have a document indicating the position in the train of each loaded placarded car containing hazardous materials, except when the position is changed or the placarded car is placed in the train by a member of the train crew. A train consist may be used to meet this requirement.

(c) A member of the train crew of a train transporting hazardous materials must have in his possession a copy of the shipping papers for the shipment of hazardous materials being transported showing the information required by §§ 172.202 and 172.203 of this subchapter.

[Amdt. 174-26, 41 FR 16092, Apr. 15, 1976, as amended by Amdt. 174-26A, 41 FR 40685, Sept. 20, 1976; Amdt. 174-26B, 41 FR 57071, Dec. 30, 1976]

§ 174.33 Lost or destroyed labels and placards.

Each carrier shall maintain an adequate supply of the labels and placards specified in Subparts E and F of Part 172 of this subchapter on hand to replace those that become lost or destroyed. The carrier shall replace each lost or destroyed label or placard, as the case may be, based on the information on the shipping papers.

§ 174.45 Reporting hazardous materials incidents.

When an incident occurs during transportation in which a hazardous material is involved, a report may be required (see §§ 171.15, 171.16 and 171.17 of this subchapter).

[Amdt. 174-37, 45 FR 34704, May 22, 1980]

§ 174.47 Correction of violations.

(a) A shipment of explosives discovered to be in violation of any of the requirements of this subchapter may not be forwarded until all discovered violations have been corrected.

(b) Unless leaking, or in a manifestly insecure condition, each package of hazardous materials other than explosives in transit must be forwarded to its destination and a report made of any violation observed.

[Amdt. 174-306, 43 FR 17945, Apr. 27, 1978]

§ 174.48 Leaking packages other than tank cars.

(a) Leaking packages other than tank cars may not be forwarded until repaired or reconditioned. Leaking or defective packages may be overpacked as required by paragraph (b) of this section. (See §§ 171.15 and 171.16 of this subchapter for reporting requirements.)

(b) Packages of hazardous materials that are damaged or found leaking during transportation, and hazardous materials that have spilled or leaked during transportation, may be forwarded to destination or returned to the shipper in a salvage drum in accordance with the requirements of § 173.3(c) of this subchapter.

[Amdt. 174-306, 43 FR 17945, Apr. 27, 1978, as amended by Amdt. 174-35, 44 FR 60102, Oct. 18, 1979]

§ 174.49 Flammable vapors.

A placarded box car, trailer-on-flatcar container-on-flatcar or car known to contain flammable liquids, gases, or vapors may not be entered with a lighted open-flame lantern, torch, or other fire, until all car doors are opened and sufficient time has been allowed for ventilation and escape of any vapors.

§ 174.50 Leaking tank cars.

(a) A tank car discovered in a leaking condition in transit may not be unnecessarily moved until the unsafe condition has been corrected. In the case of a small leak, short movements may be made if a receptacle is attached under the leak to prevent the spread of the liquid over tracks.

(b) Each leaking tank car must be protected against ignition of the liquid or vapor by flame from sources such as lanterns, torches, flares, fuses, switch lights, switch-thawing flames, fires on sides of tracks, hot coals, lighted pipes, cigars, or cigarettes. All spectators should be kept at a safe distance.

(c) Highly volatile liquids can not be transferred by a vacuum pump unless the pump is placed so that the liquid flows to it from the tank by gravity.

(d) Whenever the leaking condition of a tank car requires the transfer of lading or makes the tank unfit for reloading, the car must be stenciled on both sides in letters three inches in size, adjacent to the car number, "LEAKY TANK. DO NOT LOAD UNTIL REPAIRED". The location of the leak must be indicated and marked with the symbol "X". The owner must be immediately notified by telegram and advised of the exact location of the leak. The stenciling may not be removed until the tank is repaired.

(e) Open-flame lights may not be brought near a placarded empty or partially loaded tank car.

(f) A leaking tank car containing any hazardous material may be switched to a location distant from habitation and highways if the move can be safely made.

[Amdt. 174-26, 41 FR 16082, Apr. 15, 1976, as amended by Amdt. 174-47, 50 FR 39058, Sept. 26, 1985]

EFFECTIVE DATE NOTE: Section 174.50 was amended at 50 FR 39058, Sept. 26, 1985, by revising paragraph (e), effective October 1, 1986. The text of paragraph (e) effective October 1, 1986, is set forth below.

§ 174.50 Leaking tank cars.

* * * * *

(e) Open-flame lights may not be brought near a placarded tank car that is leaking.

* * * * *

Subpart C—General Handling and Loading Requirements

§ 174.55 General requirements.

(a) Except as otherwise specifically provided, each package of hazardous materials being transported by rail car must be loaded and blocked and braced as prescribed in this subchapter. For recommended methods of blocking and bracing in cars, truck bodies, or trailers, see Bureau of Explosives Pamphlet Nos. 6 and 6C. See loading and storage chart (§ 174.81)

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before loading labeled materials together.

(b) Packages of hazardous materials must be loaded and securely blocked and braced to prevent the packages from changing position, falling to the floor, or sliding into each other under shocks normally incident to transportation. This requirement does not preclude the use of loading methods that are designed to permit limited movement of the load and that are approved by the Department.

(c) Each package of hazardous materials bearing markings "THIS SIDE UP" or "THIS END UP" must be handled and loaded, blocked and braced, in the car to remain in the position indicated by the markings during transportation.

(d) A heavy package or container of hazardous materials may be trucked, rolled or moved by skid, fork truck, or other handling devices. It may not be dropped from any truck, platform, or rail car. Planks for rolling trucks from platforms to cars must have beveled edges.

(e) A carrier shall store hazardous materials in a secure location while they are being held for loading or delivery. The carrier shall insure that persons not having business with the carrier do not have access to these hazardous materials.

§ 174.57 Cleaning cars.

All hazardous material which has leaked from a package in any rail car or on other railroad property must be carefully removed.

§ 174.59 Marking and placarding of rail cars.

No person may transport a rail car carrying hazardous materials unless it is marked and placarded as required by this subchapter. Placards and car certificates lost in transit must be replaced at the next inspection point, and those not required must be removed at the next terminal where the train is classified. For Canadian shipments, required placards lost in transit, must be replaced either by those required by Part 172 of this subchapter or by those authorized under § 171.12a.

[Amdt. 174-26, 41 FR 16092, Apr. 15, 1976, as amended by Amdt. 174-48, 50 FR 41521, Oct. 11, 1985]

§ 174.61 Truck bodies, trailers or freight containers on flatcars.

(a) A truck body, trailer or freight container containing a hazardous material must be designed and loaded so that it will not rupture or become seriously damaged under conditions normally incident to transportation. Each unit must be secured on a flatcar so that it cannot permanently change position during transit. Packages of hazardous materials contained therein must be loaded and braced as provided by §§ 174.101, 174.112, 174.115 and 174.55. Placards must be applied when prescribed by Part 172 of this subchapter and Part 174.

(b) A truck body, trailer or freight container equipped with automatic heating or refrigerating equipment employing any fuel or article classed as a hazardous material may be loaded and transported on a flatcar if the equipment is of type examined by the Bureau of Explosives and approved by the Director, OHMT. The truck body, trailer or freight container must be secured on the flatcar so that it cannot change position during transit.

(c) A cargo tank or multi-unit tank car tank containing hazardous materials may not be transported in trailer-on-flatcar, or container-on-flatcar service except under conditions approved by the Federal Railroad Administrator.

[Amdt. 174-26, 41 FR 16092, Apr. 15, 1976, as amended by Amdt. 174-26A, 41 FR 40685, Sept. 20, 1976; Amdt. 174-36, 45 FR 32696, May 19, 1980; Amdt. 174-39, 45 FR 81572, Dec. 11, 1980; Amdt. 174-41, 47 FR 43066, Sept. 30, 1982]

§ 174.63 Freight containers, portable tanks and IM portable tanks.

(a) A freight container or portable tank containing a hazardous material must be designed and loaded so that it will not rupture, or become seriously damaged under conditions normally incident to transportation. Each unit must be secured in a closed or gondola car, on a flatcar, or in a truck body on a flatcar so that it cannot permanently change position during transit. The ends, sidewalls, or doors of a truck body or trailer may not be relied upon to prevent the shifting of a freight container or portable tank.

(b) A Specification 51, 52, 53, 56 or 57 portable tank may not be transported on flatcars or on flat trailers on flatcars, except under conditions approved by the Federal Railroad Administrator. For cargo tanks and multi-unit tank car tanks, see § 174.61(c).

(c) A Specification 51, 52, 53, 56 or 57 portable tank may be shipped only in a rail car that provides specific facilities for bracing and tie-down of these tanks. If TOFC or COFC service is utilized, the tank should be secured in its trailer body in compliance with Bureau of Explosives Pamphlet 6C.

(d) An IM 101 or IM 102 portable tank:

(1) May not be transported in container-on-flat car service (COFC) except under conditions approved by the Associate Administrator for Safety, FRA; and,

(2) May not be transported in trailer-on-flatcar (TOFC) service except under conditions approved by the Associate Administrator for Safety, FRA.

[Amdt. 174-28, 41 FR 16092, Apr. 15, 1976, as amended by Amdt. 174-28A, 41 FR 40686, Sept. 20, 1976; Amdt. 174-28B, 41 FR 57071, Dec. 30, 1976; Amdt. 174-40, 46 FR 9894, Jan. 29, 1981; Amdt. 174-40A, 46 FR 24186, Apr. 30, 1981]

§ 174.67 Tank car unloading.

(a) In unloading tank cars, the following rules must be observed (see Subpart F of this part for gases):

(1) Unloading operations must be performed only by reliable persons properly instructed in unloading hazardous materials and made responsible for careful compliance with this part.

(2) Brakes must be set and wheels blocked on all cars being unloaded.

(3) Caution signs must be so placed on the track or cars to give necessary warning to persons approaching the cars from the open end of a siding and must be left up until after the cars are unloaded and disconnected from the discharge connection. The signs must be of metal or other comparable material, at least 12 inches high by 15 inches wide in size, and bear the words, "STOP—Tank Car Connected", or "STOP—Men at Work", the word "STOP" being in letters at least 4 inches high and the other words in letters at least 2 inches high. The letters must be white on a blue background.

(4) Before a manhole cover or outlet valve cap is removed from a tank car, the car must be relieved of all interior pressure by cooling the tank with water or by venting the tank by raising the safety valve or opening the dome vent at short intervals. However, if venting to relieve pressure will cause a dangerous amount of vapor to collect outside the car, venting and unloading must be deferred until the pressure is reduced by allowing the car to stand overnight or otherwise cooling the contents. These precautions are not necessary when the car is equipped with a manhole cover which hinges inward or with an inner manhole cover which does not have to be removed to unload the car, and when pressure is relieved by piping vapor into a condenser or storage tank.

(b) After the pressure is released, the seal must be broken and the manhole cover removed as follows:

(1) *Screw type.* The cover must be loosened by placing a bar between the manhole cover lug and knob. After two complete turns, so that vent openings are exposed, the operation must be stopped, and if there is any sound of escaping vapor, the cover must be screwed down tightly and the interior pressure relieved as prescribed in paragraph (a)(4) of this section, before again attempting to remove the cover.

(2) *Hinged and bolted type.* All nuts must be unscrewed one complete turn, after which same precautions as prescribed for screw type cover must be observed.

(3) *Interior type.* All dirt and cinders must be carefully removed from around the cover before the yoke is unscrewed.

(c) When the car is unloaded through a bottom outlet valve, the manhole cover must be adjusted as follows:

(1) *Screw type.* The cover must be put in place, but not entirely screwed down, so that air may enter the tank through the vent holes in threaded flange of the cover.

(2) *Hinged and bolted type.* A nonmetallic block must be placed under one edge of the cover.

(3) *Interior type.* The screw must be tightened up in the yoke so that the cover is brought up within one-half inch of the closed position.

(d) When unloading through the bottom outlet of a car equipped with an interior manhole type cover, and in each case where unloading is done through the manhole (unless a special cover with a safety vent opening and a tight connection for the discharge outlet is used), the manhole must be protected by asbestos or metal covers against the entrance of sparks or other sources of ignition of vapor, or by being covered and surrounded with wet burlap or similar cloth material. The burlap or other cloth must be kept damp by the replacement or the application of water as needed.

(e) Seals or other substances must not be thrown into the tank and the contents may not be spilled over the car or tank.

(f) The valve rod handle or control in the dome must be operated several times to see that outlet valve in bottom of tank is on its seat before valve cap is removed.

(g) The valve cap, or the reducer when a large outlet is to be used, must be removed with a suitable wrench after the set screws are loosened and a pail must be placed in position to catch any liquid that may be in the outlet chamber. If the valve cap or reducer does not unscrew easily, it may be tapped lightly with a mallet or wooden block in an upward direction. If leakage shows upon starting the removal, the cap or reducer may not be entirely unscrewed. Sufficient threads must be left engaged and sufficient time allowed to permit controlled escape of any accumulation of liquid in the outlet chamber. If the leakage stops or the rate of leakage diminishes materially, the cap or reducer may be entirely removed. If the initial rate of leakage continues, further efforts must be made to seat the outlet valve (see paragraph (f) of this section). If this fails, the cap or reducer must be screwed up tight and the tank must be unloaded through the dome. If upon removal of the outlet cap the outlet chamber is found to be blocked with frozen liquid or any other matter, the cap must be replaced immediately and a careful examination must be made to determine whether the outlet casting has been cracked. If the obstruction is not frozen liquid, the car must be unloaded through the dome. If the obstruction is frozen liquid and no crack has been found in the outlet casting, the car may, if circumstances require it, be unloaded from the bottom by removing the cap and attaching unloading connections immediately. Before opening the valve inside the tank car, steam must be applied to the outside of the outlet casting or wrap casting with burlap or other rags and hot water must be applied to melt the frozen liquid.

(h) Unloading connections must be securely attached to unloading pipes on the dome or to the bottom discharge outlets before any discharge valves are opened.

(i) Tank cars may not be allowed to stand with unloading connections attached after unloading is completed. Throughout the entire period of unloading, and while car is connected to unloading device, the car must be attended by the unloader.

(j) If necessary to discontinue unloading a tank car for any reason, all unloading connections must be disconnected. All valves must first be tightly closed, and the closures of all other openings securely applied.

(k) As soon as a tank car is completely unloaded, all valves must be made tight, the unloading connections must be removed and all other closures made tight, except that heater coil inlet and outlet pipes must be left open for drainage. The manhole cover must be reapplied by the use of a bar or wrench, the outlet valve reducer and outlet valve cap replaced by the use of a wrench having a handle at least 36 inches long, and the outlet valve cap plug, end plug, and all other closures of openings and of their protective housings must be closed by the use of a suitable tool.

(l) Railroad defect cards may not be removed.

(m) If oil or gasoline has been spilled on the ground around connections, it must be covered with fresh, dry sand or dirt.

(n) All tools and implements used in connection with unloading must be kept free of oil, dirt, and grit.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 174-26, 41 FR 16092, Apr. 15, 1976, as amended by Amdt. 174-26A, 41 FR 40685, Sept. 20, 1976; Amdt. 174-43, 48 FR 27699, June 16, 1983; 48 FR 50440, Nov. 1, 1983]

§ 174.69 Removal of placards and car certificates after unloading.

When lading requiring placards or car certificates is removed from rail cars other than tank cars, placards and car certificates must be removed by the party unloading the car. For empty tank cars, the placards must be removed, replaced or reversed in accordance with the provisions of § 172.510(c) of this subchapter.

[Amdt. 174-26B, 41 FR 57071, Dec. 30, 1976]

Effective Date Note: Section 174.69 was revised at 50 FR 39008, Sept. 26, 1985, effective October 1, 1986. Section 174.69 set forth below becomes effective October 1, 1986.

§ 174.69 Removal of placards and car certifications after unloading.

When lading requiring placards or car certificates is removed from a rail car other than a tank car, each placard and car certificate must be removed by the person unloading the car. For a tank car which contained a hazardous material, the person responsible for removing the lading must assure, in accordance with the provisions of § 172.510(c) of this subchapter, that the tank car is properly placarded for any residue which remains in the tank car.

§ 174.81 Segregation and separation requirements for hazardous materials in rail cars.

(a) Charged electric storage batteries must not be loaded in the same car nor stored with any Class A explosive.

(b) Cyanides or cyanide mixtures must not be loaded or stored with acids or corrosive liquids.

(c) Gas identification sets may be loaded and transported with all articles named in the segregation and separation chart, except those in column c.

(d) Nitric acid, when loaded in the same car with other acids or other corrosive liquids in carboys, must be separated from the other carboys. A 2 by 6 inch plank, set on edge, should be nailed across the floor at least 12 inches from the nitric acid carboys, and the space between the plank and the carboys of nitric acid should be filled with sand, sifted ashes, or other incombustible absorbent material.

(e) Smokeless powder for small arms in quantities not exceeding 100 pounds net weight in one car shall be classed as flammable solid for purposes of transportation when examined for this classification by the Bureau of Explosives and approved by the Director, OHMT.

(f) Hazardous materials may not be loaded, transported, or stored together, except as provided in the following table:

Segregation and Separation Chart of Hazardous Materials

			15	14	13	12	11	10	9	8a	8	7a	7	6	5	4	3	2	1	g	f	e	d	c	b	a
CLASS A EXPLOSIVES	Low explosives or black powder	a																								
	High explosives, propellant explosives or detonating cord	b																								
	Initiating or priming explosives, wet: Diazodinitrophenol, fulminate of mercury, guanyl nitrosamino guanylidene hydrazine, lead azide, lead styphnate, nitro mannite, nitrosoguanidine, pentaerythrite tetranitrate, tetrazene, lead mononitroresorcinate	c																							X	X
	Detonators, detonating primers	d																						X	X	
	Ammunition for cannon with explosive projectiles, gas projectiles, smoke projectiles, incendiary projectiles, illuminating projectiles, ammunition for small arms with explosive projectiles, incendiary projectiles, rocket ammunition with explosive projectiles, gas projectiles, smoke projectiles, incendiary projectiles, illuminating projectiles, boosters (explosive), bursters (explosive), and supplementary charges (explosive) without detonators. 3/, 4/	e																					X	X		
	Explosive projectiles, bombs, torpedoes, mines, rifle or hand grenades (explosive), jet thrust units (jato), igniters, jet thrust, rocket motors, igniters rocket motor. 3/	f																					X	X		
	Detonating fuzes, class A, with or without radioactive components	g																			X	X		X	X	
CLASS B EXPLOSIVES	Ammunition for cannon with empty, inert-loaded or solid projectiles, or without projectiles, or rocket ammunition with empty projectiles, inert-loaded or solid projectiles or without projectiles	1																						X		
	Propellant explosives, jet thrust units (jato), igniters, jet thrust, rocket motors, rocket engines (liquid), igniters, rocket motor, starter cartridges	2																						X		
	Fireworks, special or railway torpedoes	3																		X	X	X	X	X	X	X
CLASS C EXPLOSIVES	Small arms ammunition, or cartridges, practice ammunition	4																						X		
	Primers for cannon or small arms, empty cartridge bags—black powder igniters, empty cartridge cases, primed, empty grenades, primed, combination primers or percussion caps, toy caps, explosive cable cutters, explosive rivets	5																						X		
	Percussion fuzes, tracer fuzes or tracers	6																						X		
	Time, combination or detonating fuzes	7																						X		
	Detonators, detonating primers	7a															X				X	X		X	X	
	Safety squibs, fuse lighters, fuse igniters, delay electric igniters, electric squibs, instantaneous fuse or igniter cord	8																						X		
	Detonating cord	8a										X					X			X			X	X		
	Fireworks, common	9										X								X	X	X	X	X	X	X
OTHER HAZARDOUS MATERIALS	Blasting agents, n.o.s., or ammonium nitrate-fuel oil mixture; blasting agent label	10										X					X						X	X		
	Flammable liquids or flammable gases, flammable liquid or flammable gas label	11																		X	X	X	X	X	X	X
	Flammable solids, flammable solid label Oxidizer, oxidizer label Organic peroxide, organic peroxide label	12																		X	X	X	[5]X	X	[5]X	X
	Corrosive liquids, corrosive label	13				[2]X												[2]X	[2]X	X	X	[2]X	X	X	X	X
	Nonflammable gases, N.F.G. label	14																		X	X	X	X	X	X	X
	Poisonous gases or liquids in tank car tanks, cylinders, projectiles or bombs, poison gas labels	15			X	X	X		X			X					X	X	X	X	X	X	X	X	X	X
	Radioactive materials, radioactive label	16																		[6]X	[6]X	[6]X	[6]X	[6]X	[6]X	[6]X

Instructions

The letter X at an intersection shows that these materials must not be loaded or stored together. Example: Detonating fuzes, class A, with or without radioactive components, (g), must not be loaded or stored with high explosives or propellant explosives, (b).

Footnotes

1. [Reserved]

2. Unless loaded in separate ends of car, corrosive liquids must not be loaded with flammable solids, oxidizing materials, ammunition for cannon with or without projectiles, or propellant explosives, except that shippers making carload shipments of corrosive liquids and flammable solids or oxidizing materials and who have obtained prior approval from the Department may load such materials together when it is known that the mixture of contents will not cause a dangerous evolution of heat or gas.

3. Explosives, class A, and explosives, class B must not be loaded or stored with chemical ammunition containing incendiary charges or white phosphorus either with or without bursting charges.

4. Boosters (explosive), bursters (explosive), or supplementary charges (explosive) without detonators when shipped by, or for the Departments of the Army, Navy, and Air Force of the United States Government may be loaded with any of the articles named except those in columns c, d, 3, 8, 11, 12, 13, 14, 15 and 16.

5. Does not include ammonium nitrate, fertilizer grade, which may be loaded, transported or stored with high explosives, or with detonators containing no more than 1 gram of explosive each, excluding ignition and delay charges.

6. Normal uranium, depleted uranium, and thorium metal in solid form may also be loaded and transported with articles named in columns a, b, c, d, e, f, and g.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 174-45, 49 FR 7385, Feb. 29, 1984; 49 FR 9188, Mar. 12, 1984, as amended by Amdt. 174-46, 50 FR 806, Jan. 7, 1985]

Subpart D—Handling of Placarded Cars

§ 174.83 Switching of cars containing hazardous materials.

(a) In switching operations where the use of hand brakes is necessary, a loaded placarded tank car, or a draft which includes a loaded placarded tank car, may not be cut off until the preceding car or cars clear the ladder track and the draft containing the loaded placarded tank car, or a loaded placarded tank car, shall in turn clear the ladder before another car is allowed to follow. In switching operations where hand brakes are used, it must be determined by trial whether a loaded placarded car, or a car occupied by a rider in a draft containing a placarded car, has its hand brakes in proper working condition before it is cut off.

(b) Any car placarded "EXPLOSIVE A" or "POISON GAS" and any Class DOT-113 tank car placarded "FLAMMABLE GAS" may not be:

(1) Cut off while in motion,

(2) Coupled into with more force than is necessary to complete the coupling, or

(3) Struck by any car moving under its own momentum.

(c) When transporting a car placarded "EXPLOSIVES A" in a terminal, yard, or on a side track, or siding, it must be separated from the engine by at least one non-placarded car.

(d) The doors of each closed car placarded "EXPLOSIVES A" must be closed, securely fastened, and the lading securely braced before it is moved.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 174-26, 41 FR 16092, Apr. 15, 1976, as amended by Amdt. 174-26A, 41 FR 40685, Sept. 20, 1976; Amdt. 74-43, 48 FR 27699, June 16, 1983; 48 FR 50440, 50442, Nov. 1, 1983]

§ 174.84 Switching of flatcars carrying placarded trailers, freight containers, portable tanks or IM portable tanks.

(a) A placarded flatcar or a flatcar carrying a placarded trailer, freight container, portable tank or IM portable tank under this subchapter may not be cut off while in motion.

(b) No rail car moving under its own momentum may be permitted to strike any placarded flatcar or any flatcar carrying a placarded trailer, freight container, portable tank or IM portable tank.

(c) No placarded flatcar or any flatcar carrying a placarded trailer, freight container, portable tank or IM portable tank may be coupled into with more force than is necessary to complete the coupling.

[Amdt. 174-40, 46 FR 9894, Jan. 29, 1981]

§ 174.85 Placement of freight cars placarded "EXPLOSIVES A" in yards, on sidings, or side tracks.

A rail car placarded "EXPLOSIVES A" while in a yard or on a siding or side track must be placed so that it will be safe from all probable danger of fire. A car so placarded may not be placed under a bridge or overhead highway crossing, not in or alongside a passenger shed or station except for loading or unloading purposes.

§ 174.86 Position in train of cars placarded "EXPLOSIVES A" or "POISON GAS" when accompanied by cars carrying guards or technical escorts.

A rail car placarded "EXPLOSIVES A" or "POISON GAS" in a moving or standing train must be next to and ahead of any car occupied by the guards or technical escorts accompanying this car. However, if a car occupied by guards or technical escorts is equipped with a lighted heater or stove, it must be the fourth car behind any car requiring "EXPLOSIVES A" placards.

[Amdt. 174-26, 41 FR 16092, Apr. 15, 1976, as amended by Amdt. 174-26A, 41 FR 40685, Sept. 20, 1976]

§ 174.87 Placarded cars prohibited in passenger trains, limited in mixed trains.

(a) A placarded rail car may not be transported in a passenger train. However, it may be transported in a mixed train, but only at such times and between such points that freight train service is not in operation and subject to the following limitations:

(1) A placarded car (other than one placarded "COMBUSTIBLE") may not be transported next to an occupied caboose or a car carrying passengers in mixed trains, except as provided in § 174.86.

(2) When a car containing hazardous materials requiring labels is moved in a mixed train and it is not occupied by an employee of the carrier, placards must be applied to the car as required by Subpart F of Part 172 of this subchapter.

§ 174.88 Position in train of cars placarded "EXPLOSIVES A".

In a moving or standing train, a car placarded "EXPLOSIVES A" may not be placed nearer than the sixth car from the engine or an occupied caboose. However, when the length of the train will not permit this car to be so placed, it must be placed as near the middle of the train as possible, but not less than the second car from the engine or occupied caboose.

[Amdt. 174-26, 41 FR 16092, Apr. 15, 1976, as amended by Amdt. 174-26B, 41 FR 57071, Dec. 30, 1976]

§ 174.89 Position in train of cars placarded "RADIOACTIVE".

In a moving or standing train, a car placarded "RADIOACTIVE" may not be placed next to any other loaded placarded car (other than one placarded "COMBUSTIBLE"), an engine, occupied caboose, or carload of undeveloped film. Cars placarded "RADIOACTIVE" may be placed next to each other.

[Amdt. 174-26, 41 FR 16092, Apr. 15, 1976, as amended by Amdt. 174-26A, 41 FR 40685, Sept. 20, 1976; Amdt. 174-26B, 41 FR 57071, Dec. 30, 1976]

§ 174.90 Separating cars placarded "EXPLOSIVES A" or "POISON GAS" from other cars in trains.

(a) In a moving or standing train, a car placarded "EXPLOSIVES A" or "POISON GAS" may not be placed next to:

(1) A passenger car or combination car that may be occupied except as provided in § 174.86;

(2) Any loaded placarded car other than a car placarded with the same placard or one placarded "COMBUSTIBLE".

(3) An engine;

(4) A wooden underframe car (except on narrow gauge railroads);

(5) A loaded flatcar, except that loaded cars placarded "EXPLOSIVES A" may be placed next to each other. A flatcar equipped with permanently attached ends of rigid construction is considered to be an open-top car. (See paragraph (a)(6) of this section.)

(6) An open-top car when any of the lading protrudes beyond the car ends or when any of the lading extending above the car ends is liable to shift so as to protrude beyond the car ends;

(7) A car with automatic refrigeration or heating apparatus in operation, or a car with open-flame apparatus in service, or with an internal combustion engine in operation;

(8) A car containing lighted heaters, stoves, or lanterns;

(9) A car occupied by any person, including any attendant for the cargo contained therein; or

(10) An occupied caboose, except as provided in § 174.86.

(b) In a moving or standing train, a car placarded "EXPLOSIVES A" may not be placed next to a car placarded "POISON GAS".

[Amdt. 174-26, 41 FR 16092, Apr. 15, 1976, as amended by Amdt. 174-26A, 41 FR 40685, Sept. 20, 1976]

§ 174.91 Position in train of loaded placarded tank car other than car placarded "COMBUSTIBLE".

Except for a tank car placarded "COMBUSTIBLE", a loaded placarded tank car in a moving or standing train may not be nearer than the sixth car from the engine, occupied caboose, or passenger car. However, when the length of the train will not permit a loaded placarded tank car to be so placed, it must be placed as near the middle of the train as possible and not nearer than the second car from the engine, occupied caboose, or passenger car.

[Amdt. 174-26, 41 FR 16092, Apr. 15, 1976, as amended by Amdt. 174-26A, 41 FR 40685, Sept. 20, 1976]

§ 174.92 Separating loaded placarded tank cars other than cars placarded "COMBUSTIBLE" from other cars in trains.

(a) In a moving or standing train a loaded placarded tank car, other than one placarded "COMBUSTIBLE", may not be placed next to:

(1) A passenger car or combination car, other than a car occupied by technical escorts and authorized personnel accompanying shipments;

(2) Any car placarded "EXPLOSIVES A", "RADIOACTIVE", or "POISON GAS";

(3) An engine or occupied caboose;

(4) A wooden underframe car (except on narrow gauge railroads);

(5) A loaded flatcar, other than a specially equipped car in trailer-on-flatcar or container-on-flatcar service or a flatcar loaded with vehicles secured by means of a device designed for that purpose and permanently installed on the flatcar, and of a type generally accepted for handling in interchange between railroads subject to the following:

(i) A flatcar equipped with permanently attached ends of rigid construction is considered to be an open-top car (see paragraph (a)(6) of this section); and

(ii) This exception for cars in trailer-on-flatcar service does not apply to loaded flatbed trucks, loaded flatbed trailers, loaded open-top trailers, or loaded trucks or trailers without securely closed doors;

(6) An open-top car when any of the lading protrudes beyond the car ends or when any of the lading extending above the car ends is liable to shift so as to protrude beyond the car ends;

(7) A car with automatic refrigeration or heating apparatus in operation or a car with open-flame apparatus in service or with an internal combustion engine in operation;

(8) A car occupied by any person, including any attendant for the cargo contained therein.

[Amdt. 174-26, 41 FR 16092, Apr. 15, 1976, as amended by Amdt. 174-26A, 41 FR 40685, Sept. 20, 1976]

§ 174.93 Position in train of empty placarded tank cars.

In a moving or standing train, empty placarded tank cars, except empty tank cars last containing combustible liquid, may not be placed nearer than the second car from the engine or occupied caboose.

[Amdt. 174-26A, 41 FR 40685, Sept. 20, 1976]

Effective Date Note: Section 174.93 was revised at 50 FR 39008, Sept. 26, 1985, effective October 1, 1986. Section 174.93 set forth below becomes effective October 1, 1986.

§ 174.93 Position in train of a tank car displaying RESIDUE placards.

In a train, a tank car displaying RESIDUE placards may not be placed nearer than the second car from an engine or occupied caboose.

Subpart E—Detailed Requirements for Explosives

§ 174.100 Forbidden explosives.

(a) Explosives described in § 173.51 of this subchapter and initiating explosives, dry, may not be accepted for transportation by rail.

(b) Leaking or damaged packages of explosives may not be accepted for transportation by rail. Unless the carrier has knowledge or the shipper has substantiated to the carrier that a stain is due to contact with material other than a liquid explosive ingredient, the carrier shall refuse any package that shows excessive dampness, mold, or other outward sign of any oily stain, or other indication that absorption of the explosive is not perfect, or that the amount of the liquid part is greater than the absorbent can carry.

§ 174.101 Loading explosives.

(a) Boxes containing Class A explosives must be loaded so that the ends of wooden boxes will not bear against sides of any fiberboard boxes and so that the ends of any box will not cause a pressure point on a small area of another box.

(b) Explosive bombs, unfuzed projectiles, rocket ammunition and rocket motors, Class A or Class B explosives, which are not packed in wooden boxes, or large metal packages of incendiary bombs, each weighing 500 pounds or more, may be loaded in stock cars or in flat bottom gondola cars only if they

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are adequately braced. Boxed bombs, rocket ammunition and rocket motors, Class A or Class B explosives, which due to their size cannot be loaded in closed cars, may be loaded in open-top cars or on flatcars, provided they are protected from the weather and accidental ignition.

(c) Boxes of high explosives, low explosives or black powder packed in long cartridges, bags, or sift-proof liners, and containing no liquid explosive ingredient, may be loaded on their sides or ends.

(d) Class A explosives may not be loaded higher than any permanent car lining unless additional lining is provided as high as the lading.

(e) When the lading of a car includes any explosives, the weight of the lading must be distributed insofar as possible to equalize the weight on each side of the car and over the trucks.

(f) Except when boxed, metal kegs containing explosives must be loaded on their sides with their ends toward the ends of the car. Packages of explosives may not be placed in the space opposite the doors unless the doorways are boarded on the inside as high as the lading. This paragraph does not apply to palletized packages if they are braced so they cannot fall or slide into the doorways during transportation.

(g) Wooden kegs, fiber kegs, barrels, and drums must be loaded on their sides or ends, to best suit the conditions.

(h) Packages containing any Class A explosives for (see § 174.104), detonators or detonating primers must be securely blocked and braced to prevent the packages from changing position, falling to the floor, or sliding into each other, under conditions normally incident to transportation. Explosives must be loaded so as to avoid transfer at stations. For recommended methods of blocking and bracing, see Bureau of Explosives Pamphlets No. 6 and 6A. Heavy packages or containers must be trucked, rolled, or moved by skids, fork trucks, or other handling devices and may not be dropped from trucks, platforms, or cars. Planks for rolling trucks from platforms to cars must have beveled ends. Loading platforms and the shoes of each workman must be free from grit. All possible precautions must be taken against fire. Explosives must be kept in a safe place and inaccessible to unauthorized persons while being held by a carrier for loading or delivery.

(i) To prevent delays of local freight trains, when there are shipments of explosives for different destinations loaded in a "peddler car" or "way car" the shipment for each destination must be stayed separately.

(j) Forwarding and transfer stations for explosives must be provided with the necessary materials for staying.

(k) Shippers must furnish the material for staying packages of explosives loaded by them.

(l) Class A explosives may not be loaded, transported, or stored in a rail car equipped with any type of lighted heater or open-flame device, or electric devices having exposed heating coils, or in a rail car equipped with any apparatus or mechanism utilizing an internal combustion engine in its operation.

(m) [Reserved]

(n) A container car or freight container on a flatcar or a gondola car other than a drop-bottom car, when properly loaded, blocked, and braced to prevent change of position under conditions normally incident to transportation, may be used to transport any Class A explosive except black powder packed in metal containers. A freight container must be of a type approved by the Department and must be designed and maintained so as to be weathertight and so constructed that sparks cannot enter. A wooden container must be painted or treated with fire retardant material of a type approved by the Department. In addition:

(1) A freight container must be of such design and so braced as to show no evidence of failure of the container or the bracing when subjected to impact from each end of at least 8 miles per hour. Its efficiency shall be determined by actual test, using dummy loads equal in weight and general character to material to be shipped.

(2) A container car or car which is loaded with freight containers must be placarded with the explosives placards

as required by Subpart F of Part 172 of this subchapter and with properly executed car certificates as required by § 174.104.

(3) Lading must be so loaded, blocked, and braced within the freight container that it will not change position under impact from each end of at least 8 miles per hour.

(o) Class A or Class B explosives may be loaded and transported in a tight closed truck body or trailer on a flatcar. Wooden boxed bombs, rocket ammunition, and rocket motors, Class A or Class B explosives, which due to their size cannot be loaded in tight, closed truck bodies or trailers, may be loaded in or on open-top truck bodies or trailers. However, they must be protected against accidental ignition, and the wooden containers must be painted or treated with fire retardant and waterproof material of a type approved by the Department. In addition:

(1) Each truck body or trailer must meet the requirements of Part 177 of this subchapter, applicable to shipments of explosives by motor vehicle.

(2) Each truck body or trailer must be so secured on the rail car so that it will not permanently change position or show evidence of failure or impending failure of the method of securing the truck body or trailer under impact from each end of at least 8 miles per hour. Its efficiency shall be determined by actual test, using dummy loads equal in weight and general character to the material to be shipped. For recommended methods of blocking and bracing, see Bureau of Explosives Pamphlet 6C.

(3) Lading must be so loaded, blocked, and braced within or on the truck body or trailer that it will not change position under impact from each end of at least 8 miles per hour. For recommended methods of blocking and bracing see Bureau of Explosives Pamphlet 6C.

(4) Each rail car containing explosives and each rail car loaded with truck bodies, trailers or containers containing explosives must be placarded with explosives placards as required by Subpart F of Part 172 of this subchapter and with properly executed car certificates as required by § 174.104.

(5) Each fuel tank of a heater or refrigerating machinery on the truck bodies or trailers must be drained and all automatic heating or refrigerating machinery must be made inoperative by disconnection of the automatic controls or the source of power for their operations.

[Amdt. 174-26, 41 FR 16092, Apr. 15, 1976, as amended by Amdt. 174-26A, 41 FR 40685, Sept. 20, 1976; Amdt. 174-26B, 41 FR 57071, Dec. 30, 1976; Amdt. 174-36, 44 FR 70732, Dec. 10, 1979]

§ 174.102 Forbidden mixed loading and storage.

(a) Class A explosives and initiating or priming explosives may not be transported together in the same rail car. Additionally, they may not be transported or loaded in the same rail car or stored on carrier property with charged electric storage batteries or with any hazardous material for which a NONFLAMMABLE GAS, FLAMMABLE GAS, FLAMMABLE LIQUID, FLAMMABLE SOLID, OXIDIZER, ORGANIC PEROXIDE, RADIOACTIVE or CORROSIVE label is required.

(b) Explosives may not be loaded together or with other hazardous materials, except as provided in § 174.81. See § 174.104 for loading shipments of explosives or any other material in a placarded and certified car containing a shipment of Class A explosives.

§ 174.103 Disposition of damaged or astray shipments.

(a) Packages of explosives found damaged or broken in transit may be repaired when practicable and not dangerous. A broken box of high explosives that cannot be repaired must be reinforced by stout wrapping paper and twine, placed in another strong box and surrounded by dry, fine sawdust or dry and clean cotton waste or elastic wads made from dry newspapers. A ruptured can or keg must be sealed and enclosed in a strong cloth bag of good quality and boxed. Damaged packages thus protected and properly marked may be forwarded.

The box and waybill must be marked to indicate that it has been repacked.

(b) Care must be exercised in repacking damaged containers so that no spark is produced by contact of metal or other hard surfaces which could ignite loose particles of explosive compositions that may be strewn on car floors or freight. In addition, the car floors must be thoroughly swept, and washed with a plentiful supply of water. Iron-wheel trucks, metal hammers, or other metal tools that may produce sparks may not be used. Metal tools must be limited to those made of brass, bronze, or copper.

(c) Each package of explosives showing evidence of leakage of liquid ingredients must:

(1) Be refused if leakage is discovered before acceptance;

(2) Be disposed of to a person who is competent and willing to remove them from the carrier's property, if the leakage is discovered while the shipment is in transit; or

(3) Be removed immediately by consignee, if the leakage is discovered at the shipment's destination.

(d) When the disposition required by paragraph (c) of this section cannot be made, the leaking package must be packed in other boxes large enough to permit enclosure and the leaking boxes must be surrounded by at least 2 inches of dry, fine sawdust or dry and clean cotton waste, and be stored in a station magazine or other safe place until the arrival of an inspector of the Bureau of Explosives, or other authorized person, to superintend the destruction or disposition of the condemned material.

(e) If careful inspection shows that an astray shipment of explosives is in proper condition for safe transportation, it must be forwarded immediately to its destination if known, or returned to the shipper by the most practicable route.

(f) When a package in an astray shipment is not in proper condition for safe transportation (see paragraphs (a), (c), and (d) of this section), or when the name and address of the consignee and the shipper are unknown, disposition must be made as prescribed by paragraphs (c) and (d) of this section.

§ 174.104 Class A explosives; car selection, preparation, inspection, and certification.

(a) Except as provided in § 174.101 (b), (n), and (o), Class A explosives being transported by rail may be transported only in a certified and properly placarded closed car of not less than 80,000 pounds capacity, with steel underframes and friction draft gear or cushioned underframe, except that on a narrow-gauge railroad they may be transported in a car of less capacity as long as the car of greatest capacity and strength available is used.

(b) Each rail car used for transporting Class A explosives must meet the following requirements as applicable:

(1) The car must be equipped with air brakes, hand brakes, and roller bearings which are in condition for service.

(2) The car may not have any holes or cracks in the roof, sides, ends, or doors through which sparks may enter, or unprotected decayed spots which may hold sparks and start a fire.

(3) The roof of the car must be carefully inspected from the outside for decayed spots, especially under or near the running board, and such spots must be covered or repaired to prevent their holding fire from sparks. A car with a roof generally decayed, even if tight, may not be used.

(4) The doors must close tightly so that sparks cannot get in at the joints, and, if necessary to achieve this degree of tightness, the doors must be stripped. The stripping should be placed on the inside and fastened to the door frames where it will form a shoulder against which the closed doors are pressed by means of wedges or cleats in door shoes or keepers. The openings under the doors should be similarly closed. The hasp fastenings must be examined with the doors closed and fastened, and the doors must be cleated when necessary to prevent them from shifting. When the car is opened for any reason, the wedges or cleats must be replaced before car containing explosives is permitted to proceed.

(5) The roller bearings and the trucks must be carefully examined and

put in such condition as to reduce to a minimum the danger of hotboxes or other failure necessitating the setting out of the car before reaching its destination.

(6) The car must be carefully swept out before it is loaded. For less-than-carload shipments the space in which the packages are to be loaded must be carefully swept. If evidence of a potential hazardous residue is apparent after the floor has been swept, the carrier must either decontaminate the car or provide a suitable substitute car.

(7) Any holes in the floor or lining must be repaired and special care taken that there are no projecting nails or bolts or exposed pieces of metal which may work loose or produce holes in packages of explosives during transit. Protruding nails in the floor or lining which have worked loose must be drawn, and if necessary for the purpose of fastening the floor or lining, new nails must be driven through other parts thereof.

(8) Metal floor plates must be completely covered with wood, plywood, or fiber or composition sheets of adequate thickness and strength to prevent contact of the floor plates with the packages of explosives under conditions incident to transportation, except that the covering of metal floor plates is not necessary for carload shipments loaded by the Department of Defense provided the explosives are of such nature that they are not liable to leakage of dust, powder, or vapor which might become the cause of an explosion.

(9) If the car is equipped with automobile loading devices, it may not be used unless the loading device is securely attached to the roof of the car with fastenings supplementing those already provided and so fixed that it cannot fall.

(10) The car must be equipped with high-friction composition brake shoes (except metal deck flat cars used for COFC/TOFC service may be equipped with high phosphorus cast iron brakeshoes) and brake rigging designed for this type of brake shoe. Each brake shoe on the car must be at least three-eighths inch thick, and in safe and suitable condition for service.

(11) The car must have either a metal subfloor with no combustible material exposed beneath the car, or metal spark shields extending from center sill to side sills and from end sills to at least 12 inches beyond the extreme treads of the inside wheels of each truck, which are tightly fitted against the subfloor so that there is no vacant space or combustible material exposed. The metal subfloor or spark shields may not have an accumulation of oil, grease, or other debris which could support combustion.

(c) Before Class A explosives may be loaded into a rail car, the car must have been inspected and certified to be in compliance with the requirements of paragraph (b) of this section by a qualified person designated under § 215.15 of this title. The certification shall be made in Car Certificate No. 1 on the form prescribed in paragraph (f) of this section.

(d) If the carrier furnishes the car to a shipper for loading Class A explosives, the shipper or his authorized employee shall, before commencing the loading of the car, inspect the interior thereof, and after loading certify to the proper condition of the car and the loading. This certification shall be made on the first signature line in Car Certificate No. 2 on the form prescribed in paragraph (f) of this section. In addition, the finished load must be inspected and certified to be in compliance with the requirements of this part by a qualified person designated under § 215.15 of this title before the car goes forward. This certification shall be made on the second signature line in Car Certificate No. 2 on the form prescribed in paragraph (f) of this section. If the loading is performed by the carrier, Car Certificate No. 2 may only be signed by a qualified person designated under § 215.15 of this title.

(e) If a trailer or container containing Class A explosives is loaded on a flatcar, the loading and securing of the load on the car must be supervised by a representative of the shipper or carrier. The certification shall be made in Car Certificate No. 3 on the form prescribed in paragraph (f) of this section.

(f) Each car certificate for use in connection with the inspection of rail cars for the carriage of Class A explosives shall be printed on strong tag board measuring 7 by 7 inches, or 6 by 8 inches. It must be duly executed in triplicate by the carrier, and by the shipper if he loads the shipments. The original must be filed by the carrier at the forwarding station in a separate file and the other two must be attached to the car, one to each outer side on a fixed placard board or as otherwise provided.

———————————— Railroad

CAR CERTIFICATE

No. 1 ——————— Station ———————
19—.

I hereby certify that I have this day personally examined Car Number ——— and that the car is in condition for service and complies with the FRA Freight Car Safety Standards (49 CFR Part 215) and with the requirements for freight cars used to transport explosives prescribed by the DOT Hazardous Materials Regulation (49 CFR Part 174).

————————————————

Qualified Person Designated Under
49 CFR 215.15

No. 2 ——————— Station ———————
19—.

I have this day personally examined the above car and hereby certify that the explosives in or on this car, or in or on vehicles or in containers have been loaded and braced; that placards have been applied, according to the regulations prescribed by the Department of Transportation; and that the doors of cars so equipped fit or have been stripped so that sparks cannot enter.

————————————————

Shipper or his authorized agent

————————————————

Qualified Person Designated Under
49 CFR 215.15

No. 3 ——————— Station ———————
19—.

I hereby certify that I have this day personally supervised the loading of the vehicles or containers on and their securement to the above car.

————————————————

Shipper or railway employee inspecting
loading and securement

NOTE 1: A shipper must decline to use a car not in proper condition.

NOTE 2: All certificates, where applicable, must be signed.

NOTE 3: Car certificates remaining on hand as of the effective date of these regulations may be used until stocks are exhausted but not after July 1, 1977.

[Amdt. 174-26, 41 FR 16092, Apr. 15, 1976]

EDITORIAL NOTE: For Federal Register citations affecting § 174.104, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 174.105 Routing shipments, Class A explosives.

Before a shipment of Class A explosives destined to a point beyond the lines of the initial carrier is accepted from the shipper, the initial carrier shall ascertain that the shipment can go forward by the route designated. To avoid delays en route, the initial carrier must be in possession of full rate information before forwarding the shipment.

§ 174.106 "Order-Notify" or "C.O.D." shipments, Class A explosives.

(a) A carrier may not accept for transportation Class A explosives, detonators, or detonating primers in any quantity when consigned to "order-notify" or "C.O.D.", except on a through bill of lading to a place outside the United States.

(b) A carrier may not accept for transportation Class A explosives, detonators, or detonating primers which the shipper consigns to himself unless the shipper has a resident representative to receive them at the delivery point.

(c) A carrier may not accept Class A explosives for transportation subject to "stop-off privileges en route for partial loading or unloading."

[Amdt. 174-26, 41 FR 16092, Apr. 15, 1976, as amended by Amdt. 174-36, 44 FR 70732, Dec. 10, 1979]

§ 174.107 Shipping days for Class A explosives.

(a) When practicable, each carrier should designate regular days for receiving from shippers less-than-carload lots of Class A explosives for each station where the carrier accepts such shipments.

(b) To enable the carrier to provide proper cars at stations where less-than-carload shipments of Class A explosives are accepted for loading by the carrier, the shipper shall give to the carrier not less than 24-hours' notice of his intention to offer such shipments, and state their destinations. When a regular day to receive all explosives shipments offered at such a station has been designated, this notice may be waived by the carrier, but the explosives shipments must be delivered on such days in time to permit proper inspection, billing, and loading on that day.

§ 174.109 Non-agency shipments.

If a shipment of explosives is accepted by a carrier at a non-agency station, the shipper shall make provision for proper certification and placarding of cars, examination of shipments, and the loading and staying of packages in cars. Way-bills, switching orders, switching tickets, or other shipping papers must be prepared as prescribed in Part 172 of this subchapter.

§ 174.110 Car magazine.

When specially authorized by the carrier, Class A explosives in quantity not exceeding 150 pounds may be carried in construction or repair cars if the packages of explosives are placed in a "magazine" box made of sound lumber not less than 1 inch thick, covered on the exterior with metal, and provided with strong handles. The box must be plainly stenciled on the top, sides, and ends, in letters not less than 2 inches high, "EXPLOSIVES—DANGEROUS—HANDLE CAREFULLY". The box must be provided with strong hinges and with a lock for keeping it securely closed. Vacant space in the box must be filled with a cushioning material such as sawdust or excelsior, and the box must be properly stayed to prevent movement within the car. The car must be placarded with EXPLOSIVES A placards when the magazine contains Explosives A.

[Amdt. 174-26, 41 FR 16092, Apr. 15, 1976, as amended by Amdt. 174-26A, 41 FR 40685, Sept. 20, 1976]

§ 174.112 Loading Class B explosives (Also see § 174.101).

(a) Class B explosives may not be loaded, transported or stored in a rail car equipped with any type of lighted heater or open-flame device, or in a rail car equipped with any apparatus or mechanism utilizing an internal combustion engine in its operation.

(b) Except as provided in § 174.101(b), (n), or (o) Class B explosives must be transported in a closed car or container car which is in good condition, and into which sparks cannot enter. The car does not require the car certificates prescribed in § 174.104(c)-(f). If the doors are not tight, they must be stripped to prevent the entrance of sparks. Wood floored cars must be equipped with spark shields (see § 174.104). Packages of Class B explosives must be blocked and braced to prevent their movement and possible damage due to movement of other freight during transportation. For recommended methods of blocking and bracing see Bureau of Explosives Pamphlet No. 6.

(c) Class B explosives may not be transported in a truck body, trailer, or container on a flatcar unless:

(1) The truck body, trailer, or container is closed and tight;

(2) All automatic heating or refrigerating machinery with which the truck body, trailer, or container is equipped is inoperative; and

(3) Packages of Class B explosives are blocked and braced within the truck body, trailer, or container to prevent their movement and possible damage due to movement of other freight during transportation (ends, sidewalls, or doors of the truck body, trailer, or container may not be relied on to prevent the shifting of heavy loads). For recommended methods of blocking and bracing see Bureau of Explosives Pamphlet No. 6C. See § 174.101(o).

[Amdt. 174-26, 41 FR 16092, Apr. 15, 1976, as amended by Amdt. 174-26B, 41 FR 57072, Dec. 30, 1976]

§ 174.114 Record to be made of change of seals on "EXPLOSIVES A" laden cars.

(a) When a car seal is changed on a car requiring "EXPLOSIVES A" placards while en route or before delivery to a consignee, a record of the change showing the following information must be made on or attached to the waybill or other form of memorandum

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which must accompany the car to its destination:

____

Railroad Place Date

____

Car Initials Car Number Number or description of seal broken

____

Number or description of seal used to reseal car ______________________

____

Reasons for opening car______________________

____

Condition of load ______________________

____

Name and occupation of person opening car

____

[Amdt. 174-26, 41 FR 16092, Apr. 15, 1976, as amended by Amdt. 174-26A, 41 FR 40685, Sept. 20, 1976]

§ 174.115 Loading Class C explosives.

(a) Class C explosives may be loaded into any closed car in good condition, or into any container car in good condition. Car certificates are not required. Packages of Class C explosives must be blocked and braced to prevent their movement and possible damage due to movement of other freight during transportation. For methods of recommended loading and bracing see Bureau of Explosives Pamphlet No. 6.

(b) Class C explosives may not be transported in a truck body, trailer, or container on a flatcar unless:

(1) The truck body, trailer, or container is closed and tight;

(2) All automatic heating or refrigerating machinery with which the truck body, trailer, or container is equipped is inoperative; and

(3) Packages of Class C explosives are blocked and braced within the truck body, trailer, or container to prevent their movement and possible damage due to movement of other freight during transportation. Ends, side walls, or doors of the truck body, trailer, or container may not be relied on to prevent shifting of heavy loads. For recommended methods of blocking and bracing see Bureau of Explosives Pamphlet No. 6C.

[Amdt. 174-26, 41 FR 16092, Apr. 15, 1976, as amended by Amdt. 174-36, 44 FR 70732, Dec. 10, 1979]

Subpart F—Detailed Requirements for Gases

§ 174.200 Special handling requirements.

(a) Flammable gases may not be loaded, transported, or stored in a rail car equipped with any type of lighted heater or open-flame device, or in a rail car equipped with any apparatus or mechanism utilizing an internal combustion engine in its operation.

(b) Flammable gases may not be loaded in a truck body or trailer equipped with any type of lighted heater or any automatic heating or refrigerating apparatus when such truck bodies or trailers are loaded on flatcars except as provided in paragraph (c) of this section.

(c) Heating or refrigeration apparatus may be operated on a motor vehicle loaded on a flatcar when the motor vehicle is loaded with flammable gases only if:

(1) The lading space is not equipped with any electrical apparatus that is not non-sparking or explosion-proof;

(2) There is no combustion apparatus in the lading space;

(3) There is no connection for the return of air from the lading space to any combustion apparatus; and

(4) The heating system conforms to § 393.77 of this title and does not heat any part of the lading over 130 degrees F.

§ 174.201 Compressed gas cylinders.

(a) Except as provided in paragraphs (b) and (c) of this section, cylinders containing compressed gases being transported in a rail car must be:

(1) Securely lashed in an upright position so as to prevent their overturning;

(2) Loaded into racks securely attached to the car;

(3) Packed in boxes or crates of such dimensions as to prevent their overturning; or

(4) Loaded in a horizontal position.

(b) Specification DOT-4L (§ 178.57 of this subchapter) cylinders being transported in a rail car must be loaded in an upright position and be securely braced.

(c) Cylinders containing compressed gases may be transported in stock cars, gondola cars and flat cars. However, they may not be transported in hopper bottom cars.

[Amdt. 174-26, 41 FR 16092, Apr. 15, 1976, as amended by Amdt. 174-26A, 41 FR 40685, Sept. 20, 1976; Amdt. 174-32, 43 FR 48644, Oct. 19, 1978]

§ 174.204 Tank car delivery of gases, including cryogenic liquids.

(a) A tank car containing compressed gas may not be unloaded unless it is consigned for delivery and unloaded on a private track (see § 171.8 of this subchapter). However, if a private track is not available, it may be delivered and unloaded on carrier tracks subject to the following conditions:

(1) A tank car of DOT-106A or 110A type (§ 179.300 or § 179.301 of this subchapter) may not be delivered and the loaded unit tanks may not be removed from the car frame on carrier tracks. However, a carrier may give permission for the unloading of these containers on carrier tracks only if a private siding is not available within a reasonable trucking distance of the final destination. In addition, before the car is accepted for transportation, the shipper must obtain from the delivering carrier and file with the originating carrier, written permission for the removal and the consignee must furnish an adequately strong mechanical hoist by which the tanks can be lifted from the car and deposited directly upon vehicles furnished by the consignee for immediate removal from carrier property.

(2) The following tank cars may not be delivered and unloaded on carrier tracks unless the lading is piped directly from the car to permanent storage tanks of sufficient capacity to receive the entire contents of the car; however, such cars may be stored on a private track (see § 171.8 of this subchapter) or on carrier tracks designated by the carrier for such storage:

(i) A tank car containing flammable cryogenic liquid; or

(ii) A tank car, except for a DOT-106A or 110A multi-unit tank car tank (§ 179.300 or § 179.301 of this subchapter), containing anhydrous ammonia; hydrogen chloride, refrigerated liquid; hydrocarbon gas, liquefied; or liquefied petroleum gas; and having interior pipes for liquid and gas discharge valves equipped with check valves.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 174-26, 41 FR 16092, Apr. 15, 1976, as amended by Amdt. 174-26A, 41 FR 40685, Sept. 20, 1976; Amdt. 174-32, 43 FR 48644, Oct. 19, 1978; Amdt. 174-43, 48 FR 27699, June 16, 1983; 48 FR 50440, 50441, Nov. 1, 1983]

§ 174.208 Rail cars, truck bodies, or trailers with fumigated or treated lading.

(a) A carrier may not accept or transport a rail car or a rail car loaded with a truck body or trailer, containing lading which has been fumigated or treated with a flammable liquid or gas within the preceding 48 hours, unless the truck body or trailer and the car, in the case of a closed car, has been ventilated to remove any danger of fire or explosion due to the presence of flammable vapor.

(b) A rail car or a rail car loaded with a truck body or trailer containing lading which has been fumigated or treated with a poisonous liquid, gas, or solid, must be placarded on each door (or as close as possible to the door if it is not possible to placard the door) with the placard described in § 173.9 of this subchapter.

[Amdt. 174-26, 41 FR 16092, Apr. 15, 1976, as amended by Amdt. 174-42, 48 FR 10244, Mar. 10, 1983]

§ 174.280 Poison gases with foodstuffs.

A carrier may not transport any package of gaseous material bearing a poison label in the same car with material which is marked as or known to be foodstuff, feed, or any other edible material intended for consumption by humans or animals.

§ 174.290 Poison A shipped by, for, or to the Department of Defense.

(a) Poison A shipped by, for, or to the Department of Defense may be transported by rail only if it is loaded and handled in accordance with the requirements of this section.

(b) Poison A may be transported in:

(1) DOT-5A or WD-5A[1] metal drums, by boxcar, gondola car (flat bottom), or stock car in carload lots. See § 174.55(a)(1) through (4) and § 174.600 for blocking, bracing, and stowage requirements;

(2) Tanks which are authorized under this subchapter for Poison A, Specification DOT 106A (§§ 179.300 and 179.301 of this subchapter), mounted on or secured to a multi-unit car or gondola car (flat bottom) in carload lots only;

(3) Bombs, by boxcar, or gondola car (flat bottom) in carload lots only; or

(4) Projectiles or ammunition for cannon with gas filled projectiles, by boxcar in carload or less-than-carload lots.

(c) Each shipment of one or more carloads of Poison A, as described in paragraph (b) of this section, must be accompanied by a Department of Defense qualified escort supplied with equipment to handle leaks and other packaging failures which could result in escape of the gas. The escort shall remain with the shipment during the entire time that it is in the custody of the carrier and in the event of leakage or escape of gas, shall make repairs and perform decontamination as necessary.

(d) When Poison A is transported in a tank, the tank must be securely mounted on a rail car especially provided for it or on a gondola car prepared with substantial wooden frames and blocks.

(e) Bombs, projectiles, and cannon ammunition being transported by rail must be loaded, blocked and braced as shown in Bureau of Explosives Pamphlet No. 6A, or Department of Defense specifications. When a shipment is loaded in a gondola car it must be securely blocked and braced and not loaded higher than the sides of the car.

(f) When Poison A is transported in drums with filling holes in the heads, they must be loaded on their bottoms. They may be loaded in rows, lengthwise of the car and any space between the sides of the car and the nearest row of drums must be "filled in" with wooden boards or lumber nailed to sides of the car sufficient in length and width to contact both hoops of drums, or they may be loaded across the car in staggered stacks of which the number of drums in alternate stacks is reduced by one drum. All drums in stacks following the first stack loaded in the end of the car must be placed tightly into the angle of the space formed by the sidewalls of the drum in the preceding stack. Any space between the sides of the car and the drums in stacks having the greater number of drums must be filled in with wooden boards or lumber nailed to sides of the car sufficient in length and width to contact both hoops of the drums.

(g) When Poison A is transported in drums with filling holes in the sides, they must be loaded on their sides with the filling holes up. They must be loaded lengthwise of the car in rows and any space between the sides of the car and the nearest row of drums must be filled in with wooden boards or lumber nailed to sides of the car sufficient in length and width to contact both hoops of the drums.

(h) When Poison A is transported in drums in a boxcar, they must be loaded from ends of the car toward the space between the car doors, and there braced by center gates and wedges. See Sketch 1, Bureau of Explosives Pamphlet No. 6.

(i) The doorways of a boxcar in which Poison A is being transported must be protected by one of the methods prescribed in Sketch 1, Bureau of Explosives Pamphlet No. 6A.

[Amdt. 174-26, 41 FR 16092, Apr. 15, 1976, as amended by Amdt. 174-26A, 41 FR 40686, Sept. 20, 1976]

Subpart G—Detailed Requirements for Flammable Liquids

§ 174.300 Special handling requirements.

(a) Flammable liquids may not be loaded, transported, or stored in a rail car equipped with any type of lighted heater or open-flame device, or in a rail car equipped with any apparatus or mechanism utilizing an internal combustion engine in its operation.

---

[1] War Department specification container.

(b) A truck body or trailer which is loaded with a flammable liquid and equipped with a lighted heater or any automatic heating or refrigerating apparatus may not be loaded on a flatcar except as provided in paragraph (c) of this section.

(c) Heating or refrigeration apparatus on a motor vehicle loaded with flammable liquids may be operated while the motor vehicle is loaded on a flatcar only if:

(1) The lading space is not equipped with any electrical apparatus that is not non-sparking or explosion-proof;

(2) There is no combustion apparatus in the lading space;

(3) There is no connection for the return of air from the lading space to any combustion apparatus; and

(4) The heating system conforms to § 393.77 of this title and does not heat any part of the lading over 130 degrees F.

(d) Cylinders containing pyrophoric liquids, unless packed in strong box or case and secured therein to protect valves, must be loaded with all valves and safety relief devices in the vapor space. All cylinders must be secured so that no shifting may occur in transit.

(e) Metal barrels or drums containing flammable liquids may be transported in a steel gondola or flatcar or in a stock car. However, they may not be transported in a hopper bottom car.

[Amdt. 174-26, 41 FR 16092, Apr. 15, 1976, as amended by Amdt. 174-31, 43 FR 31143, July 20, 1978]

§ 174.304 Flammable liquids in tank cars.

A tank car containing a flammable liquid, other than liquid road asphalt or tar, may not be transported by rail unless it is originally consigned or subsequently reconsigned to a party having a private track on which it is to be delivered and unloaded (see § 171.8 of this subchapter) or to a party using railroad siding facilities which are equipped for piping the liquid from the tank car to permanent storage tanks of sufficient capacity to receive the entire contents of the car.

[Amdt. 174-26, 41 FR 16092, Apr. 15, 1976, as amended by Amdt. 174-32, 43 FR 48644, Oct. 19, 1978]

§ 174.380 Poisonous flammable liquids with foodstuffs.

A carrier may not transport any package of flammable liquid bearing a poison label in the same car with material which is marked as or known to be food-stuffs, feed, or any other edible material intended for consumption by humans or animals.

Subpart H—Detailed Requirements for Flammable Solids

§ 174.410 Special handling requirements for matches.

(a) Each carload lot of strike-anywhere (friction) matches must be loaded as compactly as possible to avoid motion within the car, especially lengthwise of the car. Protruding nails, metal band anchors or other projections on sidewalls, ends, door posts, studding, or car floors likely to puncture packages must be removed or adequately covered to prevent damage to the containers of matches. Car doorways must be boarded on the inside to keep the packages from contacting the doors, and the inside lining of the car must be supplemented when necessary by strips nailed to the car and close enough together to keep the boxes from being jammed against the studding and broken by high pressures on small areas. The strongest dimension of the box must be loaded lengthwise of the car. Partial layers of boxes must be interlocked with the lower layers. The cars used must be made secure against the entrance of sparks or rain.

(b) Each carload lot of strike-anywhere matches handled subject to stop-off privileges must be loaded in accordance with paragraph (a) of this section and when necessary the load must be rearranged or blocked and braced by each consignee before forwarding.

(c) Each less-than-carload lot of strike-anywhere matches must be loaded so that it cannot fall and so that other packages of freight cannot fall on or injure it. Whenever practicable the packages of matches must be placed so as to facilitate ready removal in case of fire.

(d) A carload or less-than-carload lot of strike-anywhere matches which has been damaged by fire, or by water in extinguishing a fire, in transit or on a carrier's property must be reloaded in properly prepared cars, and braced or blocked before being forwarded to destination, to a freight claim department or claim adjuster, or to the original shipper or other party for salvage. Care must be taken to examine and repair damaged outside packages before reloading into car. All loose matches must first be destroyed. Individual interior boxes and paper-wrapped cartons or packages, must then be carefully placed in tight outside packages complying, as nearly as practical, with container specifications, but under no condition shall the outside package be of less strength than required by Specification 15A or 12C (§§ 178.168, 178.206 of this subchapter), nor of greater capacity than authorized. Charred cases may not be used. Boards used in repairing wooden cases must be so nailed that they will not allow any interior boxes, cartons, or packages to fall out. If the individual boxes or paper-wrapped packages do not fit snugly in the outside package, the vacant spaces must be filled tightly with dry and clean cotton waste, or elastic wads of dry newspapers or dry waste paper.

[Amdt. 174-26, 41 FR 16092, Apr. 15, 1976, as amended by Amdt. 174-26A, 41 FR 40686, Sept. 20, 1976]

§ 174.450 Fires.

(a) *Cotton.* When fire occurs in a rail shipment of cotton in transit at a point where it cannot be reconditioned and where arrangements cannot be made with the originating carrier to sell it, all burnt cotton in the shipment must be stored under observation in as safe a place as practicable where it shall be held for not less than 10 days after all evidence of fire has been extinguished before forwarding. The billing must be changed to read "Burnt Cotton" and the cotton must be forwarded as a hazardous material. (See § 173.159 of this subchapter.)

(b) *Charcoal.* When fire occurs in a rail shipment of charcoal in transit, water should not be used if it is practicable to locate and remove the burning charcoal. Any charcoal which has become wet in extinguishing a fire must be removed from the car and not reshipped and the remainder of the charcoal must be held under observation in a dry place for at least five days before forwarding.

§ 174.480 Poisonous flammable solids with foodstuffs.

A carrier may not transport any package of flammable solid material bearing a poison label in the same car with material which is marked as or known to be foodstuffs, feed, or any other edible material intended for consumption by humans or animals.

[Amdt. 174-26, 41 FR 16092, Apr. 15, 1976, as amended by Amdt. 174-26B, 41 FR 57072, Dec. 30, 1976]

Subpart I—Detailed Requirements for Oxidizers

§ 174.510 Special handling requirements for nitrates.

A nitrate listed in § 173.182(b) of this subchapter being transported by rail may only be transported in a clean closed car, which is free of loose boards, cracks, holes, and exposed decayed spots. The interior of the car must be swept clean and be free of any projections capable of damaging bags when the nitrate is so packaged. The doors of the car must have tight closures. Ammonium nitrate (no organic coating), ammonium nitrate fertilizer (materials tested in accordance with and meeting the definition in the Fertilizer Institute's publication "Definition and Test Procedures for Ammonium Nitrate Fertilizer", dated May 7, 1971), ammonium nitrate mixed fertilizer, or ammonium nitrate phosphate may be transported in bulk in a clean covered hopper car having journals and boxes in good condition.

§ 174.515 Cleaning cars; potassium permanganate.

After potassium permanganate is unloaded from a rail car, the car must be thoroughly cleaned unless the car is used exclusively in the carriage of potassium permanganate.

§ 174.580 Poisonous oxidizers with foodstuffs.

A carrier may not transport any package of oxidizer material bearing a poison label in the same car with material which is marked as or known to be foodstuff, feed, or any other edible material intended for consumption by humans or animals.

[Amdt. 174-26, 41 FR 16092, Apr. 15, 1976, as amended by Amdt. 174-26A, 41 FR 40686, Sept. 20, 1976]

Subpart J—Detailed Requirements for Poisonous Materials

§ 174.600 Special handling requirements for Poison A materials.

A tank car containing Poison A may not be transported by rail unless it is originally consigned or subsequently reconsigned to a party having a private track on which it is to be delivered and unloaded (see § 171.8 of this subchapter) or to a party using railroad siding facilities which are equipped for piping the liquid or gas from the tank car to permanent storage tanks or sufficient capacity to receive the entire contents of the car.

[Amdt. 174-26, 41 FR 16092, Apr. 15, 1976, as amended by Amdt. 174-39, 45 FR 81572, Dec. 11, 1980]

§ 174.615 Cleaning cars.

(a) A rail car which has contained arsenic, arsenate of lead, sodium arsenate, calcium arsenate, Paris green, calcium cyanide, potassium cyanide, sodium cyanide, or other poisonous materials which show any evidence of leakage from packages, must be thoroughly cleaned after unloading before the car is returned to service.

(b) After poisonous materials are unloaded from a rail car, that car must be thoroughly cleaned unless the car is used exclusively in the carriage of poisonous materials.

§ 174.680 Poisons with foodstuffs.

A carrier may not transport any package of material bearing a poison label in the same car with material which is marked as or known to be foodstuffs, feed, or any other edible material intended for consumption by humans or animals.

[Amdt. 174-26, 41 FR 16092, Apr. 15, 1976, as amended by Amdt. 174-26A, 41 FR 40686, Sept. 20, 1976]

Subpart K—Detailed Requirements for Radioactive Materials

§ 174.700 Special handling requirements for radioactive materials.

(a) Each rail shipment of low specific activity materials as defined in § 173.403 of this subchapter must be loaded so as to avoid spillage and scattering of loose material. Loading restrictions are prescribed in § 173.425 of this subchapter.

(b) The number of packages of radioactive materials that may be transported in any rail car or stored at any single location is limited to that number which does not make a total transport index number (as defined in § 173.403(bb) of this subchapter, and determined by adding together the transport index numbers on the labels of the individual packages) of more than 50. This provision does not apply to exclusive use shipments as described in §§ 173.403, 173.425, 173.441, and 173.457.

(c) Each package of radioactive material bearing RADIOACTIVE YELLOW-II or RADIOACTIVE YELLOW-III labels when being placed in a rail car, depot, or other place may not be placed closer than three feet to an area (or dividing partition between areas) which may be continuously occupied by any passenger, rail employee, or shipment of animals, nor closer than 15 feet to any package containing undeveloped film (if so marked). If more than one package of radioactive materials is present, the distance must be computed from the table below on the basis of the total transport index number (determined by adding together the transport index numbers on the labels of the individual packages) of packages in the car or storeroom:

Total transport index	Minimum separation distance in feet to nearest undeveloped film [1]	Minimum distance in feet to area of persons, or minimum distance in feet from dividing partition of a combination car [2]
None	0	0
0.1 to 10.0	15	3
10.1 to 20.0	22	4
20.1 to 30.0	29	5
30.1 to 40.0	33	6
40.1 to 50.0	36	7

[1] In feet to nearest undeveloped filmed.

[2] In feet to area of persons, or minimum distance in feet from dividing partition of a combination car.

NOTE: The distance in the table must be measured from the nearest point on the packages of radioactive materials.

(d) Each fissile Class III radioactive material shipment (as defined in § 173.455(a)(3) of this subchapter) must be transported in accordance with one of the methods prescribed in § 173.457 of this subchapter. The transport controls must be adequate to assure that no fissile Class III shipment is transported in the same rail car with any other fissile radioactive material shipment. In loading and storage areas each fissile Class III shipment must be segregated by a distance of at least 20 feet from other packages required to bear one of the "radioactive" labels described in Part 172 of this subchapter.

(e) A flatcar may be used to transport radioactive materials in a container weighing 15,000 pounds or more. A gondola car (other than a drop bottom car) may be used to transport any of the following:

(1) Radioactive materials in containers weighing 5,000 pounds or more;

(2) Strong wooden boxes with inside containers of solid radioactive material, securely braced and cushioned; or

(3) Radioactive material in concrete-filled metal drums or in concrete vaults weighing 700 pounds or more.

(f) A person may not remain unnecessarily in a rail car containing radioactive materials.

(g) In the case of packages shipped under the exclusive use provisions of § 173.441(b) for packages with external radiation levels in excess of 200 millirem per hour at the package surface:

(1) The rail car shall meet the requirements for a closed transport vehicle (§ 173.403 of this subchapter);

(2) Provisions shall be made to secure the packages so that their position within the rail car remains fixed under conditions normally incident to transportation; and

(3) The radiation level shall not exceed 2 millirem per hour in any normally occupied position in the transport vehicle or adjacent rail car.

[Amdt. 174-26, 41 FR 16092, Apr. 15, 1976]

EDITORIAL NOTE: For Federal Register citations affecting § 174.700, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 174.715 Cleanliness of cars after use.

(a) Each transport vehicle used for transporting radioactive materials as exclusive use, as defined in § 173.403 of this subchapter, must be surveyed with appropriate radiation detection instruments after each use. A vehicle may not be returned to service until the radiation dose rate at any accessible surface is 0.5 millirem per hour or less, and there is no significant removable radioactive surface contamination, as defined in § 173.443 of this subchapter.

(b) This section does not apply to any rail car used solely for transporting radioactive materials if a survey of the interior surface of the car shows that the radiation does rate does not exceed 10 millirem per hour at the interior surface or 2 millirem per hour at 3 feet from any interior surface. The car must be stenciled with the words "FOR RADIOACTIVE MATERIALS USE ONLY" in lettering at least 3 inches high in a conspicuous place on both sides of the exterior of the car and it must be kept closed at all times other than during loading and unloading.

[Amdt. 174-26, 41 FR 16092, Apr. 15, 1976, as amended by Amdt. 174-26A, 41 FR 40686, Sept. 20, 1976; Amdt. 174-39, 45 FR 81572, Dec. 11, 1980; Amdt. 174-42, 48 FR 10245, Mar. 10, 1983]

§ 174.750 Incidents involving leakage.

(a) In addition to the incident reporting requirements of §§ 171.15 and 171.16 of this subchapter, the carrier shall also notify the shipper at the earliest practicable moment following any incident in which there has been breakage, spillage, or suspected radioactive contamination involving radioactive materials shipments. Vehicles, buildings, areas, or equipment in which radioactive materials have been spilled may not be again placed in service or routinely occupied until the radiation does rate at any accessible surface is less than 0.5 millirem per hour and there is no significant removable radioactive surface contamination (see § 173.443 of this subchapter).

(b) The package or materials should be segregated as far as practicable from personnel contact. If radiological advice or assistance is needed, the Energy Research and Development Administration (ERDA) should also be notified. In case of obvious leakage, or if it appears likely that the inside container may have been damaged, care should be taken to avoid inhalation, ingestion, or contact with the radioactive material. Any loose radioactive materials should be left in a segregated area and held pending disposal instructions, from qualified persons. Information involving the handling of radioactive materials in the event of a wreck may be found in Bureau of Explosives Pamphlet No. 1 and No. 2.

[Amdt. 174-26, 41 FR 16092, Apr. 15, 1976, as amended by Amdt. 174-42, 48 FR 10245, Mar. 10, 1983]

Subpart L—Detailed Requirements for Corrosive Materials

§ 174.800 Special handling requirements for corrosive materials.

(a) Carboys of corrosive liquids may not be transported by rail in a container car. Packages of corrosive liquids being transported in a rail car must be loaded, blocked, and braced so that they cannot change position during transportation due to shocks normally incident to transportation. Car doors may be cleated in an open position. Carboys of acid may be transported on a flat or stock car.

(b) When a less-than-carload shipment of corrosive liquids is loaded in a rail car with other freight, the carboys must be placed near the doorway of the car and must have wooden strips not less than 3 inches in height nailed to the car floor about 8 inches from the bracing. These strips must be arranged so that the liquid from a broken carboy will drain toward the doorway and outside the car. The space between the strips and the floor braces or blocking used for staying the carboy boxes must be covered with at least 1 inch thickness of clean and dry sand or earth, not sawdust or other combustible material.

(c) A carrier may not accept any carboy previously used for the shipment of corrosive liquids for transportation as an empty carboy unless it has been thoroughly and completely drained. The carrier must handle them with the necks up.

§ 174.810 Special handling requirements for wet electric storage batteries.

(a) Electric storage batteries (wet) for shipment by rail must be completely protected so that short circuits will be prevented and may not be loaded or stored with explosives.

(b) Wet electric storage batteries, and electrolyte must be packed as required by § 173.258 of this subchapter for transportation by rail and must be blocked and braced in the rail car so they cannot change position during transportation due to shocks normally incident to transportation. They must be loaded so that other freight cannot fall onto or slide against them. They may be transported in a gondola car or on a flatcar. However, they may not be transported in a hopper bottom car.

(c) Wet electric storage batteries are not authorized in refrigerator or "plug-door" type cars unless the cars are provided with vents which will prevent an accumulation of gas within the car.

[Amdt. 174-26, 41 FR 16092, Apr. 5, 1976, as amended by Amdt. 174-26A, 41 FR 40686, Sept. 20, 1976; Amdt. 174-26B, 41 FR 57072, Dec. 30, 1976]

§ 174.812 Special handling requirements for nitric acid.

(a) Carboys of nitric acid may not be transported in a boxcar or in a truck body or trailer on a flatcar more than two tiers high except that completely boxed carboys, DOT-1D, may be loaded three tiers high.

(b) Nitric acid, being transported by rail, with other corrosive liquids in carboys, must be separated from the other carboys. A 2 × 6 inch plank, set on edge, must be nailed across the car floor at least 12 inches from the nitric acid carboys and the space between the plank and the carboys of nitric acid must be filled with sand, sifted ashes, or other noncombustible absorbent material.

[Amdt. 174-26, 41 FR 16092, Apr. 15, 1976, as amended by Amdt. 174-26A, 41 FR 40686, Sept. 20, 1976]

Subpart M—Detailed Requirements for Other Regulated Materials

§ 174.840 Special loading and handling requirements for asbestos.

Asbestos must be loaded, handled, and unloaded, and any asbestos contamination of rail cars removed, in a manner that will minimize occupational exposure to airborne asbestos particles released incident to transportation. (See § 173.1090 of this subchapter.)

[Amdt. 174-33, 43 FR 56668, Dec. 4, 1978]

PART 175—CARRIAGE BY AIRCRAFT

Subpart A—General Information and Regulations

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AUTHORITY: 49 U.S.C. 1803, 1804, 1806, 1807, 1808; 49 CFR 1.53(e), unless otherwise noted.

SOURCE: Amdt. 175-1, 41 FR 16106, Apr. 15, 1976, unless otherwise noted.

EDITORIAL NOTE: Nomenclature changes to Part 175 appear at 43 FR 48645, Oct. 19, 1978 (Amdt. 175-6) and at 50 FR 45731, Nov. 1, 1985.

Subpart A—General Information and Regulations

§ 175.1 Purpose and scope.

This part prescribes requirements, in addition to those contained in Parts 171, 172 and 173 of this subchapter, applicable to aircraft operators transporting hazardous materials aboard (including attached to or suspended from) aircraft.

[Amdt. 175-15, 45 FR 35332, May 27, 1980]

§ 175.3 Unacceptable hazardous materials shipments.

Hazardous materials that are not prepared for shipment in accordance with this subchapter may not be accepted for transportation or transported aboard an aircraft.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 175-25, 47 FR 54822, Dec. 6, 1982]

§ 175.5 Applicability.

(a) This part applies to the acceptance for transportation, loading and transportation of hazardous materials in any aircraft in the United States and in aircraft of United States registry anywhere in air commerce. This part does not apply to:

(1) Aircraft owned and operated by a government when not engaged in carrying persons or property for commercial purposes;

(2) Aircraft which are not owned by a government nor engaged in carrying persons or property for commercial purposes but which are under the exclusive direction and control of a government for a period of not less than 90 days as specified in a written contract or lease. An aircraft is under the exclusive direction and control of a government when the government exercises responsibility for:

(i) Approving crew members and determining that they are qualified to operate the aircraft;

(ii) Determining the airworthiness and directing maintenance of the aircraft; and

(iii) Dispatching the aircraft, including the times of departure, airports to be used, and type and amount of cargo to be carried;

(3) Aircraft of United States registry under lease to and operated by foreign nationals outside the United States if:

(i) Hazardous materials forbidden aboard aircraft by § 172.101 of this subchapter are not carried on the aircraft; and

(ii) Other hazardous materials are carried in accordance with the regulations of the State (nation) of the aircraft operator.

[Amdt. 175-15, 45 FR 35332, May 27, 1980]

§ 175.10 Exceptions.

(a) This subchapter does not apply to:

(1) Aviation fuel and oil in tanks that are in compliance with the installation provisions of 14 CFR, Chapter 1.

(2) Aircraft parts, equipment, and supplies (other than fuel) carried by an aircraft operator if authorized or required aboard his aircraft for their operation including:

(i) Fire extinguishers;

(ii) Cylinders containing compressed gases;

(iii) Aerosol dispensers;

(iv) Distilled spirits;

(v) Hydraulic accumulators;

(vi) Non-spillable batteries;

(vii) First-aid kits;

(viii) Signaling devices;

(ix) Tires; and

(x) Items of replacement therefor, except batteries, aerosol dispensers, and signaling devices must be packed in strong outside containers, and tires must be serviceable and may not be inflated to pressures greater than their rated inflation pressures.

(3) Hazardous materials loaded and carried in hoppers or tanks of aircraft certificated for use in aerial seeding, dusting, spraying, fertilizing, crop improvement, or pest control, to be dispensed during such an operation.

(4) Medicinal and toilet articles carried by a crewmember or passenger in his baggage (including carry-on baggage) when:

(i) The total capacity of all the containers used by a crewmember or passenger does not exceed 75 ounces (net weight ounces and fluid ounces);

(ii) The capacity of each container other than an aerosol container does not exceed 16 fluid ounces or 1 pound of material.

(5) Small-arms ammunition for personal use carried by a crewmember or passenger in his baggage (excluding carry-on baggage) if securely packed in fiber, wood, or metal boxes.

(6) [Reserved]

(7) Oxygen, or any hazardous material used for the generation of oxygen, carried for medical use by a passenger in accordance with 14 CFR 121.574 or 135.114.

(8) Human beings and animals with an implanted medical device, such as a heart pacemaker, that contains radioactive material or with radio-pharmaceuticals that have been injected or ingested.

(9) Smoke grenades, flares, or similar devices carried only for use during a sport parachute jumping activity.

(10) Personal smoking materials intended for use by any individual when carried on his person except lighters with flammable liquid reservoirs and containers containing lighter fluid for use in refilling lighters.

(11) Smoke grenades, flares, and pyrotechnic devices affixed to aircraft carrying no person other than a required flight crewmember during any flight conducted at and as a part of a scheduled air show or exhibition of aeronautical skill. The affixed installation accommodating the smoke grenades, flares, or pyrotechnic devices on the aircraft must be approved by the FAA for its intended use.

(12) Hazardous materials which are loaded and carried on or in cargo aircraft only and which are to be dispensed or expended during flight for weather control, forest preservation and protection, flood control, or avalanche control purposes when the following requirements are met:

(i) Operations may not be conducted over densely populated areas, in a congested airway, or near any airport where air carrier passenger operations are conducted.

(ii) Each operator shall prepare and keep current a manual containing operational guidelines and handling procedures, for the use and guidance of flight, maintenance, and ground personnel concerned in the dispensing or expending of hazardous materials. The manual must be approved by the FAA Civil Aviation Security Office responsible for the operator's overall aviation security program or the FAA Civil Aviation Security Office in the region where the operator is located. Each operation must be conducted in accordance with the manual.

(iii) No person other than a required flight crewmember, FAA inspector, or person necessary for handling or dispensing the hazardous material may be carried on the aircraft.

(iv) The operator of the aircraft must have advance permission from the owner of any airport to be used for the dispensing or expending operation.

(v) When dynamite and blasting caps are carried for avalanche control flights, the explosives must be handled and, at all times, be under the control of the blaster who is licensed under a state or local authority identified in writing to the FAA Civil Aviation Security Office responsible for the operator's overall aviation security program or the FAA Civil Aviation Security Office in the region where the operator is located.

(13) Carbon dioxide, solid (dry ice) in quantities not exceeding 5 pounds per package packed as prescribed by § 173.615(a) of this subchapter and used as a refrigerant for the contents of the package. The package must be marked with the name of the contents being cooled, the net weight of the dry ice or an indication that the net weight is 5 pounds or less, and also marked "Carbon Dioxide, Solid" or "Dry Ice."

(14) A transport incubator unit necessary to protect life or an organ preservation unit necessary to protect human organs provided:

(i) The compressed gas used to operate the unit is in an authorized DOT specification cylinder and is marked, labeled, filled and maintained as prescribed by this subchapter;

(ii) Each battery used in the operation of the unit is of the nonspillable type;

(iii) The unit is constructed so that valves, fittings, and gauges are protected from damage;

(iv) The pilot in command is advised when the unit is on board, and when it is intended for use;

(v) The unit is accompanied by a person qualified to operate it;

(vi) The unit is secured in the aircraft in a manner so as not to restrict access to or use of any required emergency or regular exit or of the aisle in the passenger compartment; and,

(vii) Smoking within ten feet of the unit is prohibited.

(15) Alcoholic beverages, perfumes and colognes carried aboard a passenger-carry aircraft by the operator for use or sale on the aircraft.

(16) Alcoholic beverages, perfumes and colognes, purchased through duty free sales, carried by passengers or crew as carry-on baggage.

(17) Carbon dioxide, solid (dry ice) intended for use in food and beverage service aboard aircraft and dry ice in quantities not exceeding 4 pounds per passenger when used to pack perishables in carry-on baggage.

(18) Carbon dioxide gas cylinders worn by passengers for the operation of mechanical limbs and spare cylinders of a similar size for the same purpose in sufficient quantities to ensure an adequate supply for the duration of the journey.

(19) Wheel chairs with non-spillable batteries, as defined in § 173.260(d) of this subchapter, as checked baggage, provided that the battery is disconnected, the battery terminals are insulated to prevent accidental short circuits, and the battery is securely attached to the wheel chair.

(20) Wheel chairs with spillable batteries, as checked baggage, provided that the wheel chair can be loaded, stowed, secured, and unloaded always in an upright position. The battery must be disconnected, the terminals insulated to prevent accidental short circuits, and the battery securely attached to the wheel chair. The pilot-in-command must be advised either orally or in writing of the location of the wheel chair aboard the aircraft prior to departure. If the wheel chair cannot be loaded, stowed, secured and unloaded always in an upright position, the battery must be removed and the wheel chair may then be carried as checked baggage without restriction. The removed battery must be carried in strong, rigid, outside packagings as follows:

(i) Outside packagings must be leak-tight, impervious to battery fluid, loaded aboard the aircraft in accordance with the required orientation markings and be protected against upset by securing to pallets or by securing them in cargo compartments using appropriate means of securement (other than by bracing with freight or baggage) such as by use of restraining straps, brackets or holders;

(ii) Batteries must be protected against short circuits, secured upright in their outside packagings, and surrounded by compatible absorbent material sufficient to absorb their total liquid contents; and

(iii) Outside packagings must be marked to indicate proper orientation, and with the words "Battery, wet, with wheel chair", and be labeled with a Corrosive label.

(21) Catalytic hair curlers containing hydrocarbon gas, not more than one per passenger or crew member, when carried in checked baggage, provided that the safety cover is securely fitted over the heating element. Gas refills for such curlers are not permitted in checked or carry-on baggage.

(22) A mercurial barometer carried as carry-on-baggage only, by a representative of a government weather bureau or similar official agency, provided that individual advises the operator of the presence of the barometer in his baggage. The barometer must be packaged in a strong outer packaging having sealed inner liner or bag of strong, leak proof and puncture-resistant material impervious to mercury, which will prevent the escape of mercury from the package irrespective of its position. The pilot-in-command must be informed of the presence of any such barometer by the operator of the aircraft.

(49 U.S.C. 1803, 1804, 1806, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 175-1, 41 FR 16106, Apr. 15, 1976]

EDITORIAL NOTE: For Federal Register citations affecting § 175.10, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 175.20 Compliance.

Unless the regulations in this subchapter specifically provide that another person must perform a duty, each operator shall comply with all the regulations in Parts 106, 171, 172, and 175 of this subchapter and shall thoroughly instruct his employees in relation thereto. (See 14 CFR 121.135, 121.401, 121.433a, 135.27 and 135.140.)

[Amdt. 175-1, 41 FR 16106, Apr. 15, 1976, as amended by Amdt. 175-18, 45 FR 81572, Dec. 11, 1980]

§ 175.25 Informing passengers about hazardous materials restrictions.

(a) Each aircraft operator who engages in for hire transportation of passengers shall display notices to passengers concerning the requirements and penalties associated with the carriage of hazardous materials aboard aircraft. Such a notice shall be prominently displayed in each location at an airport where the aircraft operator issues tickets, checks baggage, and maintains aircraft boarding areas.

(1) Each notice must contain the following information:

> Federal law forbids the carriage of hazardous materials aboard aircraft in your luggage or on your person.
>
> A violation can result in penalties of up to $25,000 and 5 years imprisonment. (49 U.S.C. 1809)
>
> Hazardous materials include explosives, compressed gases, flammable liquids and solids, oxidizers, poisons, corrosives and radioactive materials.
>
> Examples: Paints, lighter fluid, fireworks, tear gases, oxygen bottles, and radio-pharmaceuticals.
>
> There are special exceptions for small quantities (up to 75 ounces total) of medicinal and toilet articles carried in your luggage and certain smoking materials carried on your person.
>
> For further information contact your airline representative.

(2) The information contained in paragraph (a)(1) of this section must be printed:

(i) In legible English;

(ii) In lettering of at least three eighths of an inch in height for the first three paragraphs and one quarter inch in height for the last three paragraphs; and

(iii) On a background of contrasting color.

(3) Size and color of the notice are optional. Additional information, if not inconsistent with required information, may be included.

[Amdt. 175-12, 45 FR 13091, Feb. 28, 1980, as amended by 175-23, 47 FR 43066, Sept. 30, 1982]

§ 175.30 Accepting and inspecting shipments.

(a) No person may accept a hazardous material for transportation aboard an aircraft unless the hazardous material is:

(1) Authorized, and is within the quantity limitations specified for carriage aboard aircraft according to § 172.101 of this subchapter or as otherwise specifically provided by this subchapter.

(2) Described and certified on a shipping paper prepared in duplicate in accordance with Subpart C of Part 172 or as authorized by § 171.11 of this subchapter. The originating aircraft operator must retain one copy of each shipping paper for 90 days;

(3) Labeled and marked in accordance with Subparts D and E of Part 172 or as authorized in § 171.11 of this subchapter, and placarded (when required) in accordance with Subpart F of Part 172 of this subchapter; and,

(4) Labeled with a "CARGO AIRCRAFT ONLY" label (see § 172.448 of this subchapter) if the material as presented is not permitted aboard passenger-carrying aircraft.

(b) Except as provided in paragraph (d) of this section, no person may carry a hazardous material in a package, outside container, or overpack aboard an aircraft unless the package, outside container, or overpack is inspected by the operator of the aircraft immediately before placing it:

(1) Aboard the aircraft; or,

(2) In a unit load device or on a pallet prior to loading aboard the aircraft.

(c) A hazardous material may only be carried aboard an aircraft if, based on the inspection prescribed in paragraph (b) of this section, the operator determines that the package, outside container, or overpack containing the hazardous material:

(1) Has no holes, leakage or other indication that its integrity has been compromised; and

(2) For radioactive materials, does not have a broken seal, except that packages contained in overpacks need not be inspected for seal integrity.

(d) The requirements of paragraphs (b) and (c) of this section do not apply to:

(1) An ORM-D material packed in a freight container and offered for transportation by one consignor;

(2) Dry ice (carbon dioxide, solid); or

(3) Magnetized materials.

(e) An overpack containing packages of hazardous materials may be accepted only if the operator has taken all reasonable steps to establish that:

(1) The overpack does not contain a package bearing the "CARGO AIRCRAFT ONLY" label unless the overpack affords clear visibility of and easy access to the package,

(2) The proper shipping names, identification numbers, labels and special handling instructions appearing on the inside packages are clearly visible or reproduced on the outside of the overpack, and

(3) Has determined that a statement to the effect that the inside packages comply with the prescribed specifications appears on the outside of the overpack, when specification packagings are prescribed.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 175-1, 41 FR 16106, Apr. 15, 1976, as amended by Amdt. 175-1A, 41 FR 40686, Sept. 20, 1976; Amdt. 175-12, 45 FR 13091, Feb. 28, 1980; Amdt. 175-17, 45 FR 68654, Oct. 11, 1980; Amdt. 175-23, 47 FR 54822, Dec. 6, 1982]

§ 175.31 Reports of discrepancies.

(a) Each person who discovers a discrepancy, as defined in paragraph (b) of this section, relative to the shipment of a hazardous material following its acceptance for transportation aboard an aircraft shall, as soon as practicable, notify the nearest FAA Air Transportation Security Field Office by telephone and shall provide the following information:

(1) Name and telephone number of the person reporting the discrepancy.

(2) Name of the aircraft operator.

(3) Specific location of the shipment concerned.

(4) Name of the shipper.

(5) Nature of discrepancy.

(b) Discrepancies which must be reported under paragraph (a) of this section are those involving hazardous materials which are improperly described, certified, labeled, marked, or packaged, in a manner not ascertainable when accepted under the provisions of § 175.30(a) of this subchapter, including:

(1) Package which are found to contain hazardous materials:

(i) Other than as described or certified on shipping papers;

(ii) In quantities exceeding authorized limits;

(iii) In inside containers which are not authorized or have improper closures;

(iv) In inside containers not oriented as shown by package markings;

(v) With insufficient or improper absorption materials, when required; or

(2) Packages or baggage which are found to contain hazardous materials subsequent to their being offered and accepted as other than hazardous materials.

[Amdt. 175-15, 45 FR 35332, May 27, 1980]

§ 175.33 Notification of pilot-in-command.

(a) Except as provided in § 175.10, when a hazardous material subject to the provisions of this subchapter is carried in an aircraft, the operator of the aircraft shall provide the pilot-in-command at least the following information in writing as early as practicable prior to departure:

(1) The proper shipping name, hazard class and identification number of the material as specified in § 172.101 of this subchapter or the ICAO Technical Instructions. If a hazardous material is described by the proper shipping name, hazard class, and identification number appearing in:

(i) Section 172.101 of this subchapter, any additional description requirements provided in §§ 172.202 and 172.203 of this subchapter must also be shown in the notification.

(ii) The ICAO Technical Instructions, any additional information required to be shown on shipping papers by § 171.11 of this subchapter must also be shown in the notification.

(2) The total number of packages;

(3) The net quantity or gross weight, as applicable, for each package except those containing radioactive materials and those for which there is no limit imposed on the maximum net quantity per package;

(4) The location of the packages aboard the aircraft;

(5) Confirmation that no damaged or leaking packages have been loaded on the aircraft;

(6) For radioactive materials, the number of packages, their category, transport index (if applicable), and their location aboard the aircraft; and

(7) Confirmation that the package must be carried on cargo aircraft only if its transportation aboard passenger-carrying aircraft is forbidden.

(8) An indication, when applicable, that a hazardous material is being carried under terms of an exemption.

(b) A copy of the written notification to pilot-in-command shall be readily available to the pilot-in-command during flight.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 175-25, 47 FR 54823, Dec. 6, 1982, as amended by Amdt. 175-30, 48 FR 53713, Nov. 29, 1983; Amdt. 175-32, 49 FR 45750, Nov. 20, 1984]

§ 175.35 Shipping papers aboard aircraft.

(a) A copy of the shipping papers required by § 175.30(a)(2) must accompany the shipment it covers during transportation aboard an aircraft.

(b) The documents required by paragraph (a) of this section and § 175.33 may be combined into one document if it is given to the pilot-in-command before departure of the aircraft.

§ 175.40 Keeping and replacement of labels.

(a) Aircraft operators who engage in the transportation of hazardous materials must keep an adequate supply of the labels specified in Subpart E of Part 172 of this subchapter, on hand at each location where shipments are loaded aboard aircraft.

(b) Lost or detached labels for packages of hazardous materials must be replaced in accordance with the information provided on the shipping papers.

§ 175.45 Reporting hazardous materials incidents.

(a) Each operator who transports hazardous materials shall report to the nearest FAA Civil Aviation Security Office by telephone at the earliest practicable moment after each incident that occurs during the course of transportation (including loading, unloading or temporary storage) in which as a direct result of any hazardous materials:

(1) A person is killed;

(2) A person receives injuries requiring his or her hospitalization;

(3) Estimated carrier or other property damage, or both, exceeds $50,000;

(4) Fire, breakage, or spillage or suspected radioactive contamination occurs involving shipment of radioactive materials (see § 175.700(b));

(5) Fire, breakage, spillage, or suspected contamination occurs involving shipment of etiologic agents. In addition to the report required by paragraph (a) of this section, a report on an incident involving etiologic agents should be telephoned directly to the Director, Center for Disease Control, U.S. Public Health, Atlanta, Georgia, area code 404-633-5313; or

(6) A situation exists of such a nature that, in the judgment of the carrier, it should be reported to the Department even though it does not meet the criteria of paragraph (a) (1), (2), or (3) of this section, e.g., a continuing danger to life exists at the scene of the incident

(7) If the operator conforms to the provisions of this section, the carrier requirements of § 171.15 except § 171.15(c) of this subchapter shall be deemed to have been satisfied.

(b) The following information shall be furnished in each report:

(1) Name of reporting person;

(2) Name and address of carrier represented by reporter;

(3) Phone number where reporter can be contacted;

(4) Date, time, and location of incident;

(5) The extent of the injuries, if any; and

(6) Classification, name and quantity of hazardous material involvement and whether a continuing danger to life exists at the scene.

(c) Each operator who transports hazardous materials shall report in writing, in duplicate, on DOT Form F 5800.1 within 15 days of the date of discovery, each incident that occurs during the course of transportation (including loading, unloading, or temporary storage) in which, as a direct result to hazardous materials, any of the circumstances set forth in paragraph (a) of this section occurs or there has been an unintentional release of hazardous materials from a package. Each operator making a report under this section shall send that report to the Research and Special Programs Administration, Information Systems Manager, Department of Transportation, Washington, D.C. 20590, with a separate copy to the FAA facility indicated in paragraph (a) of this section.

(d) Each operator who accepts for transportation or transport a hazardous substance shall comply with the reporting requirements of § 171.17 of this subchapter.

[Amdt. 175-1, 41 FR 16106, Apr. 15, 1976, as amended by Amdt. 175-1A, 41 FR 40686, Sept. 20, 1976; Amdt. 175-14, 45 FR 32691, May 19, 1980; Amdt. 174-37, 45 FR 74669, Nov. 10, 1980; Amdt. 175-23, 47 FR 43066, Sept. 30, 1982; Amdt. 175-29, 48 FR 50461, Nov. 1, 1983]

Subpart B—Loading, Unloading and Handling

§ 175.75 Quantity limitations aboard aircraft.

(a) Except as provided in § 175.85(c)(3), no person may carry on an aircraft:

(1) A hazardous material except as permitted by this subchapter:

(2) More than 50 pounds net weight of hazardous material (and in addition thereto, 150 pounds net weight of nonflammable compressed gas) permitted to be carried aboard passenger-carrying aircraft:

(i) In an inaccessible cargo compartment,

(ii) In any freight container within an accessible cargo compartment, or

(iii) In any accessible cargo compartment in a cargo aircraft only in a manner that makes it inaccessible unless in a freight container;

(3) Packages containing radioactive materials when their combined transport index number (determined by adding together the transport index numbers shown on the labels of the individual packages and/or overpacks):

(i) In passenger carrying aircraft, exceeds 50.0 or, for any single package, exceeds 3.0, or

(ii) In cargo aircraft only, exceeds 200.00 (for fissile radioactive materials, see § 175.702(b)(2)(iv)) or, for any single package, exceeds 10.0.

(b) No limitation applies to the number of packages of ORM material aboard an aircraft.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 175-1A, 41 FR 40686, Sept. 20, 1976, as amended by Amdt. 175-13, 45 FR 20101, Mar. 27, 1980; Amdt. 175-18, 45 FR 81572, Dec. 11, 1980; Amdt. 175-25, 47 FR 54823, Dec. 6, 1982; Amdt. 175-29, 48 FR 50461, Nov. 1, 1983]

§ 175.78 Stowage compatibility of cargo.

(a) Packages containing hazardous materials which might react dangerously with one another may not be stowed in an aircraft next to each other or in a position that would allow a dangerous interaction in the event of leakage. As a minimum, the segregation prescribed in the following Table must be maintained.

TABLE 1

		A	B	C	D	E	F	G
A	Explosives and Blasting Agents or ICAO Class 1	Note 3	Note 4	Note 4	Note 4	Note 4	Note 4	X
B	Compressed gases or ICAO Class 2	Note 4						
C	Flammable liquids or ICAO Class 3	Note 4					X	
D	Flammable liquids and solids (labeled SPONTANEOUSLY COMBUSTIBLE) or ICAO Division 4.2.	Note 4					X	X
E	Flammable solids (labeled DANGEROUS WHEN WET) or ICAO Division 4.3	Note 4					X	X
F	Oxidizers or ICAO Division 5.1 and Organic peroxides or ICAO Division 5.2	Note 4		X	X	X		X
G	Corrosive materials or ICAO Class 8	X			X	X	X	

Note 1: The letters across the top of the Table have the same meaning as the letters along the left side of the Table.

Note 2: An "X" at the intersection of a row and a column in the Table means that packages containing the indicated classes of hazardous materials may not be stowed next to or in contact with each other, or in a position which would allow interaction in the event of leakage of the contents.

Note 3: For import or export shipment, explosives other than explosives of ICAO Division 1.4, Compatibility Group S, that do not belong to the same compatibility group according to the ICAO Technical Instructions may not be stowed together, except that compatibility groups C, D and E may be stowed together. Explosives of ICAO Division 1.4, Compatibility Group S may be stowed with explosives of all compatibility groups with the exception of A and L.

Note 4: Explosives, other than safety explosives (ICAO Division 1.4, Compatibility Group S) must not be stowed together with this class.

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(b) No person may stow a package labeled BLASTING AGENT on an aircraft next to, or in a position that will allow contact with a package of special fireworks or railway torpedoes.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 175-1, 41 FR 16106, Apr. 15, 1976, as amended by Amdt. 175-8, 44 FR 31184, May 31, 1979; Amdt. 175-22, 47 FR 24587, June 7, 1982; Amdt. 175-25, 47 FR 54823, Dec. 6, 1982; Amdt. 175-30, 48 FR 53713, Nov. 29, 1983]

§ 175.79 Orientation of cargo.

(a) A package containing hazardous materials marked "THIS SIDE UP" or "THIS END UP", or with arrows to indicate the proper orientation of the package, must be stored and loaded aboard an aircraft in accordance with such markings.

(b) A package containing liquid hazardous materials not marked as indicated in paragraph (a) of this section, must be stored and loaded with closures up (other than side closures in addition to top closures).

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 175-25, 47 FR 54823, Dec. 6, 1982]

§ 175.81 Securing of packages containing hazardous materials.

(a) Packages containing hazardous materials must be secured in an aircraft in a manner that will prevent any movement in flight which would result in damage to or change in the orientation of the packages.

(b) Packages containing radioactive materials must be secured in a manner that insures that the separation requirements of §§ 175.701 and 175.702 will be maintained at all times during flight.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 175-25, 47 FR 54823, Dec. 6, 1982]

§ 175.85 Cargo location.

(a) Except as provided in § 175.10, no person may carry a hazardous material subject to the requirements of this subchapter in the cabin of a passenger-carrying aircraft or on the flight deck of any aircraft. Hazardous materials may be carried in a main deck cargo compartment of a passenger-aircraft provided that the compartment is inaccessible to passengers and that it meets all certification requirements for a Class B aircraft cargo compartment as provided in 14 CFR 25.857(b).

(b) Each package containing a hazardous material acceptable only for cargo aircraft must be loaded in such a manner that a crew member or other authorized person can see, handle and when size and weight permit, separate such packages from other cargo during flight.

(c) Notwithstanding the provisions of paragraph (b) of this section:

(1) When packages of the following hazardous materials are carried on cargo aircraft only, they may be carried in a location which is inaccessible to a crewmember during flight and are not subject to the weight limitation specified in paragraph (a)(2) of § 175.75 of this subchapter.

(i) Radioactive (ICAO Class 7) materials,

(ii) Poison B (ICAO Division 6.1) liquids and solids (except those labeled FLAMMABLE),

(iii) Irritating (ICAO Division 6.1) materials,

(iv) Etiologic (ICAO Division 6.2) agents,

(v) Flammable liquids with a flashpoint above 73° F. (23° C.) that do not meet the definition of another hazardous class,

(vi) Materials classified as Class 9 materials according to the ICAO Technical Instructions and that are being transported under that classification as provided in § 171.11 of this subchapter, and,

(vii) ORM-A, C, D or E materials.

(2) When packages of hazardous materials acceptable for cargo-only or passenger-carrying aircraft are carried on cargo aircraft only where other means of transportation are impracticable or not available, packages may be carried in accordance with procedures approved in writing by the FAA Air Transportation Security Field Office responsible for the operator's overall aviation security program or the FAA Air Transportation Security Division in the region where the operator is located.

(3) When packages of hazardous materials acceptable for cargo-only or passenger-carrying aircraft are carried on small, single pilot, cargo aircraft only being used where other means of transportation are impracticable or not available, they may be carried without quantity limitation as specified in § 175.75 in a location that is not accessible to the pilot if:

(i) No person other than the pilot, an FAA inspector, the shipper or consignee of the material or a representative of the shipper or consignee so designated in writing, or a person necessary for handling the material is carried on the aircraft;

(ii) The pilot is provided with written instructions on characteristics and proper handling of the materials; and

(iii) Whenever a change of pilots occurs while the material is on board, the new pilot is briefed under a hand-to-hand signature service provided by the operator of the aircraft.

(d) [Reserved]

(e) No person may carry a material subject to the requirements of this subchapter that is acceptable for carriage in a passenger-carrying aircraft (other than magnetized materials) unless it is located in the aircraft in a place that is inaccessible to persons other than crew-members.

(f) Paragraphs (a) and (e) of this section do not apply to a person operating an aircraft under § 175.310 which, because of its size and configuration, makes it impossible for that person to comply.

(g) No person may load magnetized material (which might cause an erroneous magnetic compass reading) on an aircraft, in the vicinity of a magnetic compass, or compass master unit, that is a part of the instrument equipment of the aircraft, in a manner that affects its operation. If this requirement cannot be met, a special aircraft swing and compass calibration may be made. No person loading magnetized materials may obscure the warning labels.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 175-1, 41 FR 16106, Apr. 15, 1976]

EDITORIAL NOTE: For Federal Register citations affecting § 175.85, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 175.88 Inspection of unit load devices.

A unit load device may not be loaded on an aircraft unless the device has been inspected and found to be free from any evidence of leakage from, or damage to, any package containing hazardous materials.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 175-25, 47 FR 54824, Dec. 6, 1982]

§ 175.90 Damaged shipments.

(a) Packages or overpacks containing hazardous materials must be inspected for damage or leakage after being unloaded from an aircraft. When packages or overpacks containing hazardous materials are carried in a unit load device, the area where the unit load device was stowed must be inspected for evidence of leakage or contamination immediately upon removal of the unit load device from the aircraft, and the packages or overpacks inspected for evidence of damage or leakage when the unit load device is unloaded. In the event of leakage or suspected leakage, the compartment in which the package, overpack, or unit load device was carried must be inspected for contamination and any dangerous level of contamination removed.

(b) Except as provided for in § 175.700, the operator of an aircraft shall remove from the aircraft any package subject to this subchapter that appears to be damaged or leaking. In the case of a package which appears to be leaking, the operator must insure that the remainder of the packages in the same shipment are in proper condition for transport aboard the aircraft and that no other package has been contaminated.

(c) No person shall place a package that is damaged or appears to be damaged or leaking aboard an aircraft subject to this part.

(d) If a package containing an etiologic agent is found to be damaged or leaking, the person finding the package shall:

(1) Avoid handling the package or keep handling to a minimum;

(2) Inspect packages adjacent to the leaking package for contamination and withhold from further transportation any contaminated packages until it is ascertained that they can be safety transported;

(3) Comply with the reporting requirement of § 171.15 of this subchapter; and

(4) Notify the consignor or consignee.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 175-25, 47 FR 54824, Dec. 6, 1982]

Subpart C—Specific Regulations Applicable According to Classification of Material

§ 175.305 Self-propelled vehicles.

(a) Self-propelled vehicles are exempt from the drainage requirements of § 173.120 of this subchapter when carried in aircraft designed or modified for vehicle ferry operations and when all of the following conditions are met:

(1) Authorization for this type operation has been given by the appropriate authority in the government of the country in which the aircraft is registered;

(2) Each vehicle is secured in an upright position;

(3) Each fuel tank is filled in a manner and only to a degree that will preclude spillage of fuel during loading, unloading, and transportation; and

(4) Each area or compartment in which a self-propelled vehicle is being transported is suitably ventilated to prevent the accumulation of fuel vapors.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 175-1, 41 FR 16106, Apr. 15, 1976, as amended by Amdt. 175-12, 45 FR 13091, Feb. 28, 1980; Amdt. 175-25, 47 FR 54824, Dec. 6, 1982]

§ 175.310 Transportation of flammable liquid fuel in small, passenger-carrying aircraft.

A small aircraft or helicopter operated entirely within the State of Alaska or into a remote area elsewhere in the United States may carry, in other than scheduled passenger operations, not more than 20 gallons of flammable liquid fuel, if:

(a) Transportation by air is the only practical means of providing suitable fuel;

(b) The flight is necessary to meet the needs of a passenger;

(c) The fuel is carried in metal containers that are either:

(1) In strong tight metal containers of not more than 5 gallons capacity, each packed inside a DOT Specification 12B fiberboard box or each packed inside a DOT Specification 15A, 15B, 15C, 16A, 19A or 19B wooden box, or in the case of a small aircraft in Alaska, each packed inside a wooden box of at least one-half inch thickness;

(2) Airtight, leakproof, inside containers of not more than 10 gallons capacity and of at least 28-gauge metal, each packed inside a DOT Specification 15A, 15B, 15C, 16A, 19A, or 19B wooden box or, in the case of a small aircraft in Alaska, each packed inside a wooden box of at least one-half inch thickness;

(3) DOT Specification 17E containers of not more than 5 gallons capacity; or

(4) Fuel tanks attached to flammable liquid fuel powered equipment under the following conditions:

(i) Each piece of equipment is secured in an upright position;

(ii) Each fuel tank is filled in a manner that will preclude spillage of fuel during loading, unloading, and transportation; and

(d) In the case of a helicopter, the fuel is carried on external cargo racks;

(e) Each area or compartment in which the fuel is loaded is suitably ventilated to prevent the accumulation of fuel vapors;

(f) Before each flight, the pilot-in-command:

(1) Informs each passenger of the location of the fuel and the hazards involved; and

(2) Prohibits smoking, lighting matches, the carrying of any lighted cigar, pipe, cigarette or flame, and the use of anything that might cause an open flame or spark, while loading or unloading or in flight; and

(g) Fuel is transferred to the fuel tanks only while the aircraft is on the surface.

[Amdt. 175-1, 41 FR 16106, Apr. 15, 1976, as amended by Amdt. 175-1A, 41 FR 40686, Sept. 20, 1976; Amdt. 175-12, 45 FR 13091, Feb. 28, 1980; Amdt. 175-21, 46 FR 58696, Dec. 3, 1981]

§ 175.320 Cargo aircraft only; only means of transportation.

(a) Notwithstanding § 172.101 of this subchapter, when means of transportation other than air are impracticable or not available, hazardous materials listed in the following table may be carried on a cargo aircraft only, subject to the conditions stated in the table and in paragraph (b) of this section and, when appropriate, paragraph (c) of this section:

Material description	Class	Conditions
Detonators and detonating primers.	Class A explosives	Permitted only when no other hazardous material is aboard the aircraft.
Detonators and detonating primers.	Class C explosives	Permitted only when there are no Class A explosives aboard aircraft.
Fuel, aviation, turbine engine; Methyl alcohol; or Toluene.	Flammable liquid	Permitted in DOT specification metal drums having rated capacities of 55 gallons or less. May not be transported in the same aircraft with materials classed as Class A, B, or C explosives, blasting agents, corrosive materials or oxidizing materials. Permitted in installed tanks each having a capacity of more than 110 gal. subject to the conditions specified in paragraph (c) of this section.
Gasoline	Flammable liquid	Permitted in metal drums having rated capacities of 55 gal. or less. May not be transported in the same aircraft with materials classed as Class A, B, or C explosives, blasting agents, corrosive materials or oxidizing materials. Permitted in installed tanks each having a capacity of more than 110 gal. Subject to the conditions specified in para. (c) of this section.
High explosives	Class A explosives	Limited to explosives to be used for blasting. Permitted only when no other cargo is aboard the aircraft or when being transported in the same aircraft with an authorized shipment of any 1 or more of the following materials to be used for blasting: Ammonium nitrate-fuel oil mixtures Blasting agent, n.o.s. Detonating cord. Propellant explosive (solid) Class B (water gels only). Propellant explosive (liquid) Class B (water gels only).
Oil n.o.s.; petroleum oil or petroleum oil, n.o.s.	Flammable liquid	Permitted in metal drums having rated capacities of 55 gal. or less. May not be transported in the same aircraft with materials classed as Class A, B, or C explosives, blasting agents, corrosive materials, or oxidizing materials. Permitted in installed tanks each having a capacity of more than 110 gal. subject to the conditions specified in para. (c) of this section.
Combustible liquid, n.o.s	Combustible liquid	Permitted in installed tanks each having a capacity of more than 110 gal subject to the conditions specified in par. (c) of this section.

(b) The following conditions apply to the carriage of hazardous materials performed under the authority of this section:

(1) No person other than a required flight crewmember, an FAA inspector, the shipper or consignee of the material or a representative of the shipper or consignee so designated in writing, or a person necessary for handling the material may be carried on the aircraft.

(2) The operator of the aircraft must have advance permission from the owner or operator of each manned airport where the material is to be loaded or unloaded or where the aircraft is to land while the material is on board. When the destination is changed after departure because of weather or other unforeseen circumstances, permission

from the owner or operator of the alternate airport should be obtained as soon as practicable before landing.

(3) At any airport where the airport owner or operator or authorized representative thereof has designated a location for loading or unloading the material concerned, the material may not be loaded or unloaded at any other location.

(4) If the material concerned can create destructive forces or have lethal or injurious effects over an appreciable area as a result of an accident involving the aircraft or the material, the loading and unloading of the aircraft and its operation in takeoff, en route, and in landing must be conducted at a safe distance from heavily populated areas and from any place of human abode or assembly.

(5) If the aircraft is being operated by a holder of a certificate issued under 14 CFR Part 121, Part 127 or Part 135, operations must be conducted in accordance with conditions and limitations specified in the certificate holder's operations specifications or operations manual accepted by the FAA. If the aircraft is being operated under 14 CFR Part 91, operations must be conducted in accordance with an operations plan accepted and acknowledged in writing by the Civil Aviation Security Office serving the operator's location or the place where the material is to be loaded.

(6) Each pilot of the aircraft must be provided written instructions stating the conditions and limitations of the operation being conducted and the name of the airport official[s] granting the advance permission required by the first sentence of paragraph (b)(2) of this section.

(7) The aircraft and the loading arrangement to be used must be approved for safe carriage of the particular materials concerned by the FAA Civil Aviation Security Office responsible for the operator's overall aviation security program or the appropriate FAA Civil Aviation Security Office serving the place where the material is to be loaded.

(8) When Class A explosives are carried aboard cargo aircraft only under the provisions of this section, the aircraft operator shall take all possible action to insure that routes over heavily populated areas are avoided commensurate with considerations of flight safety. During the approach and landing phase, the aircraft operator shall request appropriate vectors when under radar control to avoid heavily populated areas.

(9) During loading and unloading, no person may smoke, carry a lighted cigarette, cigar, or pipe, or operate any device capable of causing an open flame or spark within 50 feet of the aircraft.

(10) If the movement involves international transportation, permission for the shipment may also be required from the appropriate authorities of the countries of origin, destination, transit and overflight prior to departure.

(c) The following additional conditions apply to the carriage of flammable liquids and combustible liquids in tanks each having a capacity of more than 110 gallons under the authority of this section:

(1) The tanks and their associated piping and equipment and the installation thereof must have been approved for the material to be transported by the appropriate FAA Regional Office.

(2) In the case of an aircraft being operated by a certificate holder, the operator shall list the aircraft and the approval information in its operating specifications. If the aircraft is being operated by other than a certificate holder, a copy of the FAA Regional Office approval required by this section must be carried on the aircraft.

(3) The crew of the aircraft must be thoroughly briefed on the operation of the particular bulk tank system being used.

(4) During loading and unloading and thereafter until any remaining fumes within the aircraft are dissipated:

(i) Only those electrically operated bulk tank shutoff valves that have been approved under a supplemental type certificate may be electrically operated.

(ii) No engine or electrical equipment, avionic equipment, or auxiliary power units may be operated, except position lights in the steady position and equipment required by approved loading or unloading procedures, as set forth in the operator's operations manual, or for operators that are not certificate holders, as set forth in a written statement.

(iii) No person may fill a container, other than an approved bulk tank, with a flammable or combustible liquid or discharge a flammable or combustible liquid from a container, other than an approved bulk tank, while that container is inside or within 50 feet of the aircraft.

(iv) When filling an approved bulk tank by hose from inside the aircraft, the doors and hatches must be fully open to insure proper ventilation.

(v) Static ground wires must be connected between the storage tank or fueler and the aircraft, and between the aircraft and a positive ground device.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 175-1, 41 FR 16106, Apr. 15, 1976]

EDITORIAL NOTE: For Federal Register citations affecting § 175.320, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 175.630 Special requirements for poisons and etiologic agents.

(a) Hazardous materials bearing the POISON or ETIOLOGIC AGENT label may not be carried in the same compartment of an aircraft with material which is marked as or known to be foodstuffs, feed, or any other edible material intended for consumption by humans or animals unless either the posions or etiologic agents and the foodstuffs, feed, or other edible materials are loaded in separate unit load devices which, when stowed on the aircraft, are not adjacent to each other, or the poisions or etiologic agents are loaded in one closed unit load device and the foodstuffs, feed or other materials are loaded in another closed unit load device.

(b) No person may operate an aircraft that has been used to transport any package bearing a POISON label unless, upon removal of such package, the area in the aircraft in which it was carried is visually inspected for evidence of leakage, spillage, or other contamination. All contamination discovered must be either isolated or removed from the aircraft. The operation of an aircraft contaminated with such poisons is considered to be the carriage of poisonous materials under paragraph (a) of this section.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 175-1, 41 FR 16106, Apr. 15, 1976, as amended by Amdt. 175-25, 47 FR 54824, Dec. 6, 1982; Amdt. 175-30, 48 FR 53713, Nov. 29, 1983]

§ 175.640 Special requirements for other regulated materials.

Asbestos must be loaded, handled, and unloaded, and any asbestos contamination of aircraft removed, in a manner that will minimize occupational exposure to airborne asbestos particles released incident to transportation. (See § 173.1090 of this subchapter.)

[Amdt. 175-7, 43 FR 56668, Dec. 4, 1978]

§ 175.700 Special limitations and requirements for radioactive materials.

(a) In addition to other requirements, no person may carry in a passenger-carrying aircraft any package required to be labeled in accordance with § 172.403 of this subchapter with a Radioactive Yellow-II or Radioactive Yellow-III label unless:

(1) For a package required to be labeled Radioactive Yellow-II, the transport index does not exceed 1.0;

(2) For a package required to be labeled Radioactive Yellow-III, the transport index does not exceed 3.0;

(3) The package is carried on the floor of the cargo compartment, or freight container; and

(4) The package is carried in the aircraft in accordance with §§ 175.701 and 175.703(c).

(b) In addition to the reporting requirements of § 175.45, the carrier must also notify the shipper at the earliest practicable moment following any incident in which there has been breakage, spillage, or suspected radioactive contamination involving radioactive materials shipments. Aircraft in which radioactive materials have been spilled may not again be placed in service or routinely occupied until the radiation dose rate at any accessible surface is less than 0.5 millirem per hour and there is no significant removable radioactive surface contamination as determined in accordance with § 173.443 of this subchapter. When contamination is present or suspected, the package and/or materials it has touched must be segregated as far as practicable from personnel contact until needed radiological advice or assistance is obtained. The Regional Office of the U.S. Department of Energy or appropriate State or local radiological authorities can provide advice or assistance, and should be notified in cases of obvious leakage, or if it appears likely that the inside container may have been damaged. For personnel safety the carrier must take care to avoid possible inhalation, ingestion, or contact with radioactive materials that may have leaked or spilled from its package. Any loose radioactive materials and associated packaging materials must be left in a segregated area pending disposal instructions from responsible radiological authorities.

(c) Except as provided in §§ 173.4, 173.421-1 and 173.421-2 of this subchapter, no person may carry any radioactive material aboard a passenger-carrying aircraft unless that material is intended for use in, or incident to, research, medical diagnosis or treatment.

(d) Type B(M) packages may not be offered or accepted for transportation, nor transported, on passenger-carrying aircraft.

[Amdt. 175-13, 45 FR 20101, Mar. 27, 1980, as amended by Amdt. 175-19, 46 FR 24185, Apr. 30, 1981; Amdt. 175-26, 48 FR 10245, Mar. 10, 1983; Amdt. 175-31, 49 FR 38134, Sept. 27, 1984; 50 FR 18668, May 2, 1985]

§ 175.701 Separation distance requirements for packages containing radioactive materials in passenger-carrying aircraft.

(a) *General.* No person may carry in a passenger-carrying aircraft any package required by § 172.403 of this subchapter to be labeled Radioactive Yellow-II, or Radioactive Yellow-III unless the package is placed in the aircraft in accordance with the minimum separation distances prescribed in paragraph (b) or (c) of this section.

(b) *Separation distances.* (1) Except as provided in paragraph (c) of this section, the minimum separation distances prescribed in paragraph (b)(2) of this section are determined by measuring the shortest distance between the surfaces of the radioactive materials package and the surfaces bounding the space occupied by passengers or animals. If more than one package of radioactive materials is placed in a passenger-carrying aircraft, the minimum separation distance for these packages shall be determined in accordance with paragraph (b)(2) of this section on the basis of the sum of the transport index numbers of the individual packages or overpacks.

(2) The following table prescribes minimum separation distances for the carriage of packages containing radioactive materials labeled Radioactive Yellow-II or Radioactive Yellow-III in passenger-carrying aircraft:

Transport index or sum of transport indexes of all packages in the aircraft or predesignated area	Minimum separation distances	
	Centimeters	Inches
0.1 to 1.0	30	12
1.1 to 2.0	50	20
2.1 to 3.0	70	28
3.1 to 4.0	85	34
4.1 to 5.0	100	40
5.1 to 6.0	115	46
6.1 to 7.0	130	52
7.1 to 8.0	145	57
8.1 to 9.0	155	61
9.1 to 10.0	165	65
10.1 to 11.0	175	69
11.1 to 12.0	185	73
12.1 to 13.0	195	77
13.1 to 14.0	205	81
14.1 to 15.0	215	85
15.1 to 16.0	225	89
16.1 to 17.0	235	93
17.1 to 18.0	245	97
18.1 to 20.0	260	102
20.1 to 25.0	290	114
25.1 to 30.0	320	126
30.1 to 35.0	350	138
35.1 to 40.0	375	148
40.1 to 45.0	400	157
45.1 to 50.0	425	167

(c) *Predesignated areas.* A package required by §172.403 of this subchapter to be labeled Radioactive Yellow-II or Radioactive Yellow-III may be carried in a passenger-carrying aircraft in accordance with a system of predesignated areas established by the aircraft operator. Each aircraft operator that elects to use a system of predesignated areas shall submit a detailed description of the proposed system to the Director, OHMT for approval prior to implementation of the system. A proposed system of predesignated areas is approved if the Director, OHMT determines that it is designed to assure that:

(1) The packages can be placed in each predesignated area in accordance with the minimum separation distances prescribed in paragraph (b)(2) of this section; and

(2) The predesignated areas are separated from each other by minimum distance equal to at least four times the distances required by paragraphs (b)(1) and (b)(2) of this section for the predesignated area containing packages with the largest sum of transport indexes.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 175-13, 45 FR 20102, Mar. 27, 1980, as amended by Amdt. 175-23, 47 FR 43066, Sept. 30, 1982; Amdt. 175-25, 47 FR 54824, Dec. 6, 1982]

§ 175.702 Requirements for carriage of packages containing radioactive materials in a cargo aircraft only.

(a) As used in this section, the term "group of packages" means packages that are separated from each other in an aircraft by a distance of 20 feet (6 meters) or less.

(b) No person may carry in a cargo aircraft only any package required by § 172.403 of this subchapter to be labeled Radioactive Yellow-II or Radioactive Yellow-III unless:

(1) The total transport index for all of the packages does not exceed 50.0 and the package is carried in accordance with § 175.701(a); or

(2) The total transport index for all of the packages exceeds 50.0 and:

(i) The separation distance between the surfaces of the radioactive materials packages and the surfaces bounding the space occupied by persons or animals is at least 30 feet (9 meters);

(ii) The transport index for any group of packages does not exceed 50.0; and

(iii) Each group of packages is separated from every other group in the aircraft by not less than 20 feet (6 meters), measured from the outer surface of each group; and

(iv) The total transport index for all packages containing fissile radioactive materials does not exceed 50.0.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 175-13, 45 FR 20102, Mar. 27, 1980, as amended by Amdt. 175-29, 48 FR 50461, Nov. 1, 1983]

§ 175.703 Other special requirements for the acceptance and carriage of packages containing radioactive materials.

(a) No person may carry in an aircraft any package of radioactive materials required by § 172.403 of this subchapter to be labeled Radioactive Yellow-II or Radioactive Yellow-III closer than the distances shown in the following table to any package marked as containing undeveloped film:

Transport index	Minimum separation distance to nearest undeveloped film for various times of tra[illegible]									
	Up to 2 hours		2 to 4 hours		4 to 8 hours		8 to 12 hours		Over 12 hours	
	Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet
0.1 to 1.0	0.3	1	0.6	2	0.9	3	1.2	4	1.5	5
1.1 to 5.0	0.9	3	1.2	4	1.8	6	2.4	8	3.3	11
5.1 to 10.0	1.2	4	1.8	6	2.7	9	3.3	11	4.5	15
10.1 to 20.0	1.5	5	2.4	8	3.6	12	4.8	16	6.6	22
20.1 to 30.0	2.1	7	3.0	10	4.5	15	6.0	20	8.7	29
30.1 to 40.0	2.4	8	3.3	11	5.1	17	6.6	22	9.9	33
40.1 to 50.0	2.7	9	3.6	12	5.7	19	7.2	24	10. 8	36

(b) No person may accept for carriage in an aircraft packages of radioactive materials, other than limited quantities, contained in a rigid or nonrigid overpack, including a fiberboard box or plastic bag, unless they have been prepared for shipment in accordance with § 173.448(g) of this subchapter.

(c) No person may carry in an aircraft any package containing Fissile Class III radioactive materials (as defined in § 173.455(a)(3) of this subchapter), except:

(1) In a cargo aircraft only which has been assigned for the exclusive use of the shipper for the specific shipment of fissile radioactive material. Instructions for the exclusive use must be developed by the shipper and carrier, and the instructions issued with the shipping papers; or

(2) In an aircraft in which there are no other packages required to bear a radioactive label as prescribed in § 172.403 of this subchapter. Specific arrangements must be made between the shipper and carrier, with instructions to that effect issued with the shipping papers.

(d) No person may offer or accept for transportation, nor transport, by air:

(1) Any Type B(U) or Type B(M) package with an accessible surface temperature in excess of 50°C (122°F);

(2) Continuously vented Type B(M) packages, packages which require external cooling by an ancillary cooling system or packages subject to operational controls during transport; or

(3) Liquid pyrophoric radioactive materials.

(e) Packages with radiation levels at the package surface or a transport index in excess of the limits specified in § 173.441(a) of this subchapter may not be transported by aircraft except under special arrangements approved by RSPA.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 175-13, 45 FR 20102, Mar. 27, 1980, as amended by Amdt. 175-26, 48 FR 10245, Mar. 10, 1983; Amdt. 175-26, 48 FR 31220, July 7, 1983; Amdt. 175-29, 48 FR 50461, Nov. 1, 1983]

§ 175.705 Inspection of aircraft for contamination by radioactive materials.

(a) Aircraft used routinely for the carriage of radioactive materials shall be periodically checked for radioactive contamination. The frequency of checks shall be related to the likelihood of contamination and the extent to which radioactive materials are carried.

(b) An aircraft must be taken out of service if the level of contamination exceeds that provided in § 175.700(b).

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 175-25, 47 FR 54824, Dec. 6, 1982]

PART 176—CARRIAGE BY VESSEL

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AUTHORITY: 49 U.S.C. 1803, 1804, 1805, 1808; 49 CFR 1.53, unless otherwise noted.

SOURCE: Amdt. 176-1, 41 FR 16110, Apr. 15, 1976, unless otherwise noted.

EDITORIAL NOTE: Nomenclature changes affecting Part 176 appear at 50 FR 45731, Nov. 1, 1985.

Subpart A—General

§ 176.1 Purpose and scope.

This part prescribes requirements in addition to those contained in Parts 171, 172, and 173 of this subchapter to be observed with respect to the transportation of hazardous materials by vessel.

§ 176.3 Unacceptable hazardous materials shipments.

(a) A carrier may not transport by vessel any shipment of a hazardous material that is not prepared for transportation in accordance with Parts 172 and 173 of this subchapter.

(b) A carrier may not transport by vessel any explosive or explosive composition described in § 176.5(c).

§ 176.5 Application to vessels.

(a) Except as provided in paragraphs (b) and (e) of this section, this subchapter applies to each domestic or foreign vessel when in the navigable waters of the United States, regardless of its character, tonnage, size, or service, and whether self-propelled or not, whether arriving or departing, underway, moored, anchored, aground, or while in dry dock.

(b) With the exception of paragraph (c) of this section, this subchapter does not apply to:

(1) A public vessel not engaged in commercial service;

(2) A vessel constructed or converted for the principal purpose of carrying flammable or combustible liquid cargo in bulk in its own tanks, when only carrying these liquid cargoes;

(3) A vessel of 15 gross tons or smaller when not engaged in carrying passengers for hire;

(4) A vessel used exclusively for pleasure;

(5) A vessel of 500 gross tons or smaller when engaged in fisheries;

(6) A tug or towing vessel except when towing another vessel having explosives, flammable liquids or flammable compressed gas on board on deck in which case the tug or towing vessel shall make such provisions to guard against and extinguish fire as the Coast Guard may prescribe;

(7) A cable vessel, dredge, elevator vessel, fireboat, icebreaker, pile driver, pilot boat, welding vessel, salvage vessel, or wrecking vessel; or

(8) A foreign vessel transiting the territorial sea of the United States without entering the internal waters of the United States, if all hazardous materials being carried on board are being carried in accordance with the requirements of the IMDG Code.

(c) 46 U.S. Code 170(3) prohibits the transportation, carriage, conveying, storing, stowing or using any of the following explosives on board any vessel to which this subchapter applies:

(1) Any fulminate or other detonating compound in bulk in dry condition.

(2) Any explosive composition that can ignite spontaneously or undergo marked decomposition when subjected for 48 consecutive hours to a temperature of 167 degrees F. (75 degrees C.).

(3) Any composition containing an ammonium salt and a chlorate or other like explosive.

(d) The bulk carriage of hazardous materials by water is governed by 46 CFR Subchapters D, I, O, and N.

(e) The transportation of military explosives on board vessels is governed by 46 CFR Part 146.

[Amdt. 176-1, 41 FR 16110, Apr. 15, 1976, as amended by Amdt. 176-1A, 41 FR 40687, Sept. 20, 1976; Amdt. 176-14, 47 FR 44471, Oct. 7, 1982]

§ 176.9 "Order-Notify" or "C.O.D." shipments.

(a) A carrier may not transport Class A explosives, detonators, or detonating primers which are—

(1) Consigned to "Order-notify" or "C.O.D.", except on a through bill of lading to a place outside the United States; or

(2) Consigned by the shipper to himself unless he has a resident representative to receive the shipment at the port of discharge.

[Amdt. 176-1, 41 FR 16110, Apr. 15, 1976, as amended by Amdt. 176-10, 44 FR 70732, Dec. 10, 1979]

§ 176.11 Exceptions.

(a) A hazardous material may be offered and accepted for transportation by vessel when in conformance with the requirements of the IMDG Code in place of the corresponding requirements of this subchapter pertaining to packaging, marking, labeling, classification, description, certification and placarding. All hazardous materials must otherwise be stowed and carried in accordance with this subchapter.

(1) Hazardous materials prepared in compliance with the above requirements may also be offered and accepted for transportation and transported by a motor vehicle used in connection with the discharge or loading of a vessel and not operating on a public street or highway.

(2) This exception does not apply to the following:

(i) A hazardous material classed as Explosive A or B, or Radioactive material, or

(ii) A material which is a hazardous material under this subchapter, but which is not a hazardous material under the provisions of the IMDG Code.

(b) Canadian shipments and packages may be transported by vessel if they are transported in accordance with this subchapter. (See § 171.12a of this subchapter.)

(c) The requirements of this subchapter governing the transportation of combustible liquids do not apply to the transportation of combustible liquids in containers of 110 gallons or less on board vessels.

(d) Transport vehicles, containing hazardous materials loaded in accordance with specific requirements of this subchapter applicable to such vehicles, may be transported on board a ferry vessel or carfloat, subject to the applicable requirements specified in §§ 176.76, 176.100, and Subpart E of this part.

(e) Hazardous materials classed and shipped as ORM-D are not subject to the requirements of this part unless they are offered for transporation as hazardous wastes.

(f) The stowage requirements of § 172.101 of this subchapter notwithstanding, a hazardous material which is classed, labeled and described in accordance with § 172.102 may be stowed as provided in that section.

(g) The requirements of this subchapter do not apply to atmospheric gases used in a refrigeration system.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 176-1, 41 FR 16110, Apr. 15, 1976]

EDITORIAL NOTE: For Federal Register citations affecting § 176.11, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 176.13 Responsibility for compliance.

Unless this subchapter specifically provides that another person must perform a duty, each carrier, including a connecting carrier, shall comply with all applicable regulations in this part, and shall thoroughly instruct his employees in relation thereto.

§ 176.15 Enforcement.

(a) An enforcement officer of the U.S. Coast Guard may at any time and at any place, within the jurisdiction of the United States, board any vessel for the purpose of enforcement of this subchapter and inspect any shipment of hazardous materials as defined in this subchapter.

(b) Under the authority of 46 U.S. Code 170(13) and in the manner provided therein, a collector of customs may detain a vessel which is in violation of this subchapter.

[Amdt. 176-1, 41 FR 16110, Apr. 15, 1976, as amended by Amdt. 176-1A, 41 FR 40687, Sept. 20, 1976]

§ 176.18 Assignment and certification.

(a) The National Cargo Bureau, Inc., is authorized to assist the Coast Guard in administering this subchapter with respect to the following:

(1) Inspection of vessels for suitability for loading hazardous materials;

(2) Examination of stowage of hazardous materials;

(3) Making recommendations for stowage requirements of hazardous materials cargo; and

(4) Issuance of certificates of loading setting forth that the stowage of hazardous materials is in accordance with the requirements of 46 U.S.C. 170 and this subchapter.

(b) A certificate of loading issued by the National Cargo Bureau, Inc., may be accepted by the Coast Guard as prima facie evidence that the cargo is stowed in conformity with the requirements of 46 U.S.C. 170 and this subchapter.

Subpart B—General Operating Requirements

§ 176.24 Shipping papers.

A carrier may not transport a hazardous material by vessel unless the material is properly described on the shipping paper in the manner prescribed in Part 172 of this subchapter.

§ 176.27 Certificate.

(a) A carrier may not transport a hazardous material by vessel unless he has received a certificate prepared in accordance with § 172.204 of this subchapter.

(b) In the case of an import or export shipment of hazardous materials which will not be transported by rail, highway, or air, the shipper may certify on the bill of lading or other shipping paper that the hazardous material is properly classed, described, marked, packaged, and labeled according to Part 172 of this subchapter or in accordance with the requirements of the IMDG Code. See § 171.12 of this subchapter.

[Amdt. 176-1, 41 FR 16110, Apr. 15, 1976, as amended by Amdt. 176-1A, 41 FR 40687, Sept. 20, 1976; Amdt. 176-12, 45 FR 81572, Dec. 11, 1980; Amdt. 176-14, 47 FR 44471, Oct. 7, 1982]

§ 176.30 Dangerous cargo manifest.

(a) The carrier, its agents, and any person designated for this purpose by the carrier or agents shall prepare a dangerous cargo manifest, list, or stowage plan. This document may not include a material which is not subject to the requirements of 49 CFR or the IMDG Code. This document must be kept in a designated holder on or near the vessel's bridge. It must contain the following information:

(1) Name of vessel and official number. (If the vessel has no official number, the international radio call sign must be substituted.);

(2) Nationality of vessel;

(3) Shipping name and identification number of each hazardous material on board as listed in § 172.101 or § 172.102 of this subchapter or as listed in the IMDG Code.

(4) The number and description of packages (barrels, drums, cylinders, boxes, etc.) and gross weight for each type of packaging;

(5) Classification of the hazardous material in accordance with either;

(i) The Hazardous Materials Table, § 172.101 of this subchapter; or

(ii) The International Maritime Organization's Dangerous Goods Code as follows:

(A) For Classes 7, 8 and 9, either the class name or numerical designation of the class must be used.

(B) For Classes 1, 3, 4, 5, and 6, either the division name or numerical designation of the division must be used.

(C) For Class 2, the class name or numerical designation of the Class must be accompanied by the description "Flammable gas", "Nonflammable gas" or "Poison gas", as appropriate.

(6) Any additional description required by § 172.203 of this subchapter.

(7) Stowage location of the hazardous material on board the vessel.

(8) In the case of a vessel used for the storage of explosives or other hazardous materials, the following additional information is required:

(i) Name and address of vessel's owner;

(ii) Location of vessel's mooring;

(iii) Name of person in charge of vessel;

(iv) Name and address of the owner of the cargo; and

(v) A complete record, by time intervals of one week, of all receipts and disbursements of hazardous materials. The name and address of the consignor must be shown against all receipts and the name and address of the consignee against all deliveries.

(b) The hazardous material information on the dangerous cargo manifest must be the same as the information furnished by the shipper on the shipping order or other shipping paper, except that the IMO "correct technical name" and the IMO class may be indicated on the manifest as provided in paragraphs (a)(3) and (a)(5) of this section. The person who supervises the preparation of the manifest, list, or stowage plan shall ensure that the information is correctly transcribed, and shall certify to the truth and accuracy of this information to the best of his knowledge and belief by his signature and notation of the date prepared.

(c) The carrier and its agents shall insure that the master, or a licensed deck officer designated by the master and attached to the vessel, or in the case of a barge, the person in charge of the barge, acknowledges the correctness of the dangerous cargo manifest, list or stowage plan by his signature.

(d) For barges, manned or unmanned, the requirements of this section apply except for the following:

(1) In the case of a manned barge, the person in charge of the barge shall prepare the dangerous cargo manifest.

(2) In the case of an unmanned barge, the person responsible for loading the barge is responsible for the preparation of a dangerous cargo manifest, list, or stowage plan and must designate an individual for that purpose.

(3) For all barges, manned or unmanned, the dangerous cargo manifest must be on board the barge in a readily accessible location and a copy must be furnished to the person in charge of the towing vessel.

(e) Each carrier who transports or stores hazardous materials on a vessel shall retain a copy of the dangerous cargo manifest, list, or stowage plan for at least one year, and shall make that document available for inspection in accordance with § 176.36(b) of this subchapter.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 176-1, 41 FR 16110, Apr. 15, 1976]

EDITORIAL NOTE: For Federal Register citations affecting § 176.30, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 176.31 Exemptions.

If a hazardous material is being transported by vessel under the authority of an exemption and a copy of the exemption is required to be on board the vessel, it must be kept with the dangerous cargo manifest.

§ 176.33 Labels.

Each carrier shall maintain an adequate supply of the labels required in Subpart E of Part 172 of this subchapter to replace those that become lost or detached. Replacement must be based on information taken from the shipping order, delivery receipt, or other shipping paper covering the shipment.

§ 176.36 Preservation of records.

(a) When this part requires shipping orders, manifest, cargo lists, stowage plans, reports, or any other papers, documents or similar records to be prepared, the carrier shall preserve them or copies of them in his place of business or office in the United States for a period of one year after their preparation.

(b) Any record required to be preserved must be made available upon request to an authorized representative of the Department of Transportation.

§ 176.39 Inspection of cargo.

(a) *Manned vessels.* The carrier, its agents, and any person designated for this purpose by the carrier or agents shall cause an inspection of each hold or compartment containing hazardous materials to be made after stowage is complete, and at least once every 24 hours thereafter, weather permitting, in order to ensure that the cargo is in a safe condition and that no damage caused by shifting, spontaneous heating, leaking, sifting, wetting, or other cause has been sustained by the vessel or its cargo since loading and stowage. However, freight containers or individual barges need not be opened. A vessel's holds equipped with smoke or fire detecting systems having an automatic monitoring capability need not be inspected except after stowage is complete and after periods of heavy weather. The carrier, its agents, and any person designated for this purpose by the carrier or agents shall cause an entry to be made in the vessel's deck log book for each inspection of the stowage of hazardous materials performed.

(b) *Unmanned and magazine vessels.* An inspection of the cargo must be made after stowage has been completed to ensure that stowage has been accomplished properly and that there are no visible signs of damage to any packages or evidence of heating, leaking, or sifting. This inspection must be made by the individual who is responsible to the carrier and who is in charge of loading and stowing the cargo on the unmanned vessels or the individual in charge in the case of a magazine vessel.

(c) The carrier, its agents, and any person designated for this purpose by the carrier or agents of each oceangoing vessel carrying hazardous material shall, immediately prior to entering a port in the United States, cause an inspection of that cargo to be made.

(d) When inspecting a cargo of hazardous materials capable of evolving flammable vapors, any artificial means of illumination must be of an explosion-proof type.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 176-1, 41 FR 16110, Apr. 15, 1976, as amended by Amdt. 176-8, 44 FR 23228, Apr. 19, 1979; Amdt. 176-9, 44 FR 49458, Aug. 23, 1979]

§ 176.45 Emergency situations.

(a) When an accident occurs on board a vessel involving hazardous materials, and the safety of the vessel, its passengers or crew are endangered, the master shall adopt such procedures as will, in his judgment, provide maximum safety for the vessel, its passengers, and its crew. When the accident results in damaged packages or the emergency use of unauthorized packagings, these packages may not be offered to any forwarding carrier for transportation. The master shall notify the nearest Captain of the Port, U.S. Coast Guard, and request instructions for disposition of the packages.

(b) Hazardous materials may be jettisoned only if the master believes this action necessary to prevent or substantially reduce a hazard to human life or reduce a substantial hazard to property.

[Amdt. 176-1, 41 FR 16110, Apr. 15, 1976, as amended by Amdt. 176-1B, 41 FR 57072, Dec. 30, 1976]

§ 176.48 Situation requiring report.

(a) When a fire or other hazardous condition exists on a vessel transporting hazardous materials, the master shall notify the nearest Captain of the Port as soon as possible and shall comply with any instructions given by the Captain of the Port.

(b) When an incident occurs during transportation in which a hazardous material is involved, a report may be required (see §§ 171.15, 171.16 and 171.17 of this subchapter).

(c) If a package, portable tank, freight container, highway or railroad vehicle containing hazardous materials is jettisoned or lost, the master shall notify the nearest Captain of the Port and the Commandant (GMHM) as soon as possible of the location, quantity, and type of the material.

[Amdt. 176-1, 41 FR 16110, Apr. 15, 1976, as amended by Amdt. 176-1A, 41 FR 40687, Sept. 20, 1976; Amdt. 176-1B, 41 FR 57072, Dec. 30, 1976; Amdt. 176-11, 45 FR 34705, May 22, 1980]

§ 176.50 Acceptance of damaged or leaking packages.

A carrier may not transport by vessel any package that is so damaged as to permit the escape of its contents, that appears to have leaked, or that gives evidence of failure to properly contain the contents unless it is restored or repaired to the satisfaction of the master of the vessel. A package containing radioactive materials (other than low specific activity materials) may not be repaired or restored.

[Amdt. 176-1, 41 FR 16110, Apr. 15, 1976, as amended by Amdt. 176-1A, 41 FR 40687, Sept. 20, 1976]

§ 176.52 Rejections of shipments in violation.

(a) A carrier may not knowingly transport by vessel any hazardous material offered under a false or deceptive name, marking, invoice, shipping paper or other declaration, or without the shipper furnishing written information about the true nature of the material at the time of delivery.

(b) If a shipment in violation is found in transit, the master of the vessel shall adopt procedures which in his judgment provide maximum safety to the vessel, its passengers and its crew and which are in compliance with § 176.45. If the vessel is in port, the material may not be delivered to any party, and the master shall immediately notify the nearest Captain of the Port and request instructions for disposition of the material.

[Amdt. 176-1, 41 FR 16110, Apr. 15, 1976, as amended by Amdt. 176-1B, 41 FR 57072, Dec. 30, 1976]

§ 176.54 Repairs involving welding or burning.

(a) Except as provided in paragraph (b) of this section, repairs or work involving welding or burning, or the use of power-actuated tools or appliances which may produce intense heat may not be undertaken on any vessel having on board explosives or other hazardous materials as cargo.

(b) Paragraph (a) of this section does not apply if:

(1) The repairs or work are approved by the local Coast Guard Captain of the Port or his authorized representative; or

(2) Emergency repairs to the vessel's main propelling or boiler plant or auxiliaries are necessary.

Subpart C—General Handling and Stowage

§ 176.57 Supervision of handling and stowage.

(a) Hazardous materials may be handled or stowed on board a vessel only under the direction and observation of a qualified person assigned for this duty.

(b) For a vessel engaged in voyages coastwise, or on rivers, bays, sounds or lakes, including the Great Lakes when the voyage is not foreign-going, the person may be an employee of the carrier and assigned to this duty by the carrier, or a licensed officer attached to the vessel and assigned by the master of the vessel.

(c) For a domestic vessel engaged in a foreign-going or intercoastal voyage, the person must be an officer possessing an unexpired license issued by the U.S. Coast Guard and assigned to this duty by the carrier or master of the vessel.

(d) For a foreign vessel, the person must be an officer of the vessel assigned to this duty by the master of the vessel.

§ 176.58 Preparation of the vessel.

Each hold or compartment in which hazardous materials are to be transported must be swept clean of all debris before the hazardous materials are stowed therein. Bilges must be examined and all residue of previous cargo removed.

§ 176.60 "No Smoking" signs.

When smoking is prohibited during the loading, stowing, storing, transportation, or unloading of hazardous materials by this part, the carrier and the master of the vessel are jointly responsible for posting "NO SMOKING" signs in conspicuous locations.

§ 176.63 Stowage locations.

(a) The table in § 172.101 of this subchapter specifies generally the locations authorized for stowage of the various hazardous materials on board vessels. This part prescribes additional requirements with respect to the stowage of specific hazardous materials in addition to those authorized in § 172.101 of this subchapter. This section sets forth the basic physical requirements for the authorized locations.

(b) To qualify as "on deck" stowage, the location must be on the weather deck. If it is in a house on the weather deck, it must have a permanent structural opening to the atmosphere, such as a door, hatch companionway or manhole, and must be vented to the atmosphere. It may not have any structural opening to any living quarters, cargo, or other compartment unless the opening has means for being closed off and secured. Any deck house containing living quarters, a steering engine, a refrigerating unit, a refrigerated stowage box, or a heating unit may not be used unless that area is isolated from the cargo stowage area by a permanent, and tight metallic bulkhead. Stowage in a shelter or 'tween deck is not considered to be "on deck". A barge which is vented to the atmosphere and is stowed on deck on a barge-carrying ship is considered to be "on deck". When an entry in § 172.101 of this subchapter requires "on-deck" stowage and is qualified by the requirement "shade from radiant heat", the stowage must be protected from the direct rays of the sun by means of structural erections or awnings except that such protection is not required for shipment in portable tanks.

(c) To qualify as "under deck" stowage, the location must be in a hold or compartment below the weather deck capable of being ventilated and allotted entirely to the carriage of cargo. It must be bounded by permanent steel decks and bulkheads or the shell of the vessel. The deck openings must have means for effectively closing the hold or compartment against the weather, and in the case of superimposed holds, for effectively closing off each hold. A hold or compartment containing a crew passage formed by battens or by mesh or wire screen bulkhead may not be used for the stowage of any hazardous material unless a watchman is provided for this area.

(d) To qualify as "under deck away from heat", the location must be under deck and have built-in means for ventilation. If it is subject to heat from any artificial source, it only qualifies for the stowage of those hazardous materials for which "under deck" stowage is authorized.

[Amdt. 176-1, 41 FR 16110, Apr. 15, 1976, as amended by Amdt. 176-1A, 41 FR 40687, Sept. 20, 1976; Amdt. 176-1B, 41 FR 57072, Dec. 30, 1976; Amdt. 176-12, 45 FR 81572, Dec. 11, 1980]

§ 176.65 Alternative stowage procedures.

When a hazardous material is to be loaded on board a vessel and it is shown to the satisfaction of the Coast Guard Captain of the Port for the place where the vessel is being loaded that it is impracticable to comply with a stowage location requirement specified in the table in § 172.101 of this subchapter or a handling or stowage requirement prescribed in this part, the Captain of the Port may authorize in writing the use of an alternate stowage location or method of handling or stowage subject to such conditions as he finds will insure a level of safety at least equal to that afforded by the regulatory requirement concerned.

[Amdt. 176-1A, 41 FR 40687, Sept. 20, 1976, as amended by Amdt. 176-12, 45 FR 81573, Dec. 11, 1980]

§ 176.69 General stowage requirements for hazardous materials.

(a) Hazardous materials (except as provided in paragraph (c) of this section and ORM) must be stowed in a manner that will facilitate inspection during the voyage, its removal from a potentially dangerous situation, and the removal of packages in case of fire.

(b) Each package marked "THIS SIDE UP" must be stowed so as to remain in the position indicated during transportation.

(c) If a vessel designed for and carrying hazardous materials in freight containers or a vessel designed for and carrying hazardous materials in barges is equipped with a fixed fire extinguishing and fire detection system, the freight containers or barges need not be stowed in the manner required by paragraph (a) of this section. When freight containers or barges containing hazardous materials are stowed on deck, they need not be stowed in the manner required by paragraph (a) of this section if fire fighting equipment capable of reaching and piercing the freight container or barge is on board the vessel.

[Amdt. 176-1, 41 FR 16110, Apr. 15, 1976, as amended by Amdt. 176-1A, 41 FR 40687, Sept. 20, 1976; Amdt. 176-12, 45 FR 81573, Dec. 11, 1980]

§ 176.72 Handling of break-bulk hazardous materials.

(a) A metal bale hook may not be used for handling any package of hazardous materials.

(b) The use of equipment designed to lift or move cargo by means of pressure exerted on the packages may not be used for handling any package of hazardous materials if the device can damage the package or the package is not designed to be moved in that manner.

(c) Pallets, slings, cargo nets and other related equipment used in loading packages of hazardous materials must give adequate support to the packages. The packages must be contained so that they are not able to fall during loading.

§ 176.74 On deck stowage of break-bulk hazardous materials.

(a) Packages containing hazardous materials must be secured by enclosing in boxes, cribs or cradles and proper lashing by use of wire rope, strapping or other means, including shoring and bracing, or both. Lashing of deck cargo is permitted if eye pads are used to attach the lashings. Lashings may not be secured to guard rails. Bulky articles must be shored.

(b) A packaging susceptible to weather or water damage must be protected so that it will not be exposed to the weather or to sea water.

(c) Not more than fifty percent of the total open deck area should be used for stowage of hazardous materials (except ORM material).

(d) Fireplugs, hoses, sounding pipes, and access to these must be free and clear of all cargo.

(e) Crew and passenger spaces and areas set aside for the crew's use may not be used to stow any hazardous material.

(f) A hazardous material may not be stowed within a horizontal distance of 25 feet of an operating or embarkation point of a lifeboat.

(g) Hazardous materials must be stowed to permit safe access to the crew's quarters and to all parts of the deck required in navigation and necessary working of the vessel.

(h) When runways for use of the crew are built over stowed hazardous materials, they must be constructed and fitted with rails and lifelines so as to afford complete protection to the crew when in use.

[Amdt. 176-1, 41 FR 16110, Apr. 15, 1976, as amended by Amdt. 176-1B, 41 FR 57072, Dec. 30, 1976]

§ 176.76 Highway vehicles, railroad vehicles, freight containers, and portable tanks containing hazardous materials.

(a) Except as provided in paragraphs (b) through (f) of this section, hazardous materials (other than Class A explosives unless otherwise approved by the Commandant (G-MTH)) authorized to be transported by vessel may be carried on board a vessel in a highway vehicle, railroad vehicle, or freight container subject to the following conditions:

(1) The material must be in proper condition for transportation according to the requirements of this subchapter;

(2) All packages in the transport vehicle or container must be secured to prevent movement in any direction. However, vertical restraint is not required if the shape of the packages and the stuffing pattern precludes shifting of the load;

(3) Bulkheads made of dunnage which extend to the level of the cargo must be provided unless the packages are stowed flush with the sides or ends;

(4) Dunnage must be secured to the floor when the cargo consists of dense materials or heavy packages;

(5) Each package marked "THIS SIDE UP" must be so stowed;

(6) Any slack spaces between packages must be filled with dunnage;

(7) The weight in a container must be distributed throughout as evenly as possible and the maximum permissible weight must not be exceeded.

(8) Adjacent levels of baggaged and baled cargo must be stowed in alternate directions so that each tier binds the tier above and below it.

(9) Packages containing solids should be stowed on top of packages containing liquids.

(10) The lading must be contained entirely within the freight container or vehicle body without overhang or projection except that oversized machinery such as tractors or vehicles with batteries attached may overhang or project outside the intermodal container provided all of that portion of the lading that consists of hazardous materials is contained entirely within the freight container. No open-bed container or vehicle is permitted to carry hazardous materials unless it is equipped with a means of properly securing the lading.

(b) A highway vehicle containing hazardous materials may be carried only on board a trailership, ferry vessel or a carfloat.

(c) A railroad vehicle containing hazardous materials may be carried only on board a trainship, railroad car ferry or a carfloat.

(d) A transport vehicle or freight container equipped with heating or refrigeration equipment may be operated on board a vessel. However, the equipment may not be operated in any hold or compartment in which any flammable liquid or gas is stowed. Any heating or air conditioning equipment having a fuel tank containing a flammable liquid or gas may be stowed only "on deck". Equipment electrically powered and designed to operate within an environment containing flammable vapors may be operated below deck in a hold or compartment containing a flammable liquid or gas. (See § 176.79.)

(e) A transport vehicle, loaded with any hazardous material which is required to be stowed "on deck" by § 172.101 of this subchapter, may be stowed one deck below the weather deck when transported on a trainship or trailership which is unable to provide "on deck" stowage because of the vessel's design. Otherwise, the transport vehicle or container must be transported "on deck."

(f) Each transport vehicle, freight container, and portable tank being transported by vessel must be placarded in accordance with the requirements of Subpart F of Part 172 of this subchapter.

(g) A hazardous material may be carried on board a vessel in a portable tank subject to the following conditions:

(1) The material must be in proper condition for transportation according to the requirements of this subchapter.

(2) [Reserved]

(3) Portable tanks containing Flammable liquids or gases, Combustible liquids with flashpoints below 141° F. that are insoluble in water, or organic peroxides, spontaneously combustible materials, or water reactive materials must be stowed on deck irrespective of the stowage authorized in § 172.101 of this subchapter. Portable tanks containing hazardous materials not restricted to on deck stowage by the previous sentence must be stowed in accordance with the requirements specified in § 172.101 of this subchapter.

(4) ORM and corrosive materials must be stowed as authorized in the Hazardous Materials Table in § 172.101 of this subchapter.

(5) Aluminum, magnesium, and their alloys are specifically prohibited as materials of construction of portable tanks.

(h) *Cryogenic liquids.* For shipment of cryogenic liquids on board a vessel the packaging must be designed and filled so that:

(1) Any cryogenic liquid being transported in a cargo tank, regardless of the pressure in the package, must be contained in a steel jacketed Specification MC-338 (§ 178.338 of this subchapter) insulated cargo tank, or a cargo tank approved under the provisions of § 173.33(b)(2) of this subchapter.

(2) Any valve or fitting with moving or abrading parts that may come in

contact with any cryogenic liquid may not be made of aluminum.

(3) For a flammable cryogenic liquid being transported in a cargo tank, the elapsed time between the loading of the cargo tank and the subsequent unloading of the cargo tank at its final destination may not exceed the marked rated holding time (MRHT) of the cargo tank for the cryogenic liquid being transported, which must be displayed on or adjacent to the specification plate.

(4) Portable tanks, cargo tanks, and tank cars containing cryogenic liquids must be stowed "on deck" regardless of the stowage authorized in § 172.101 of this subchapter. Cargo tanks or tank cars containing cryogenic liquids may be stowed one deck below the weather deck when transported on a trailership or trainship that is unable to provide "on deck" stowage because of the vessel's design. Tank cars must be Class DOT-113 or AAR-204W tank cars.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 176-1, 41 FR 16110, Apr. 15, 1976]

EDITORIAL NOTE: For Federal Register citations affecting § 176.76, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 176.77 Stowage of barges containing hazardous materials on board barge-carrying vessels.

(a) A barge which contains hazardous materials may be transported on board a barge-carrying vessel if it is stowed in accordance with the requirements of this section.

(b) A barge which contains hazardous materials for which only "on deck" stowage is authorized must be stowed above the weather deck and be vented to the atmosphere.

(c) A barge which contains hazardous materials for which both "on deck" and "below deck" storage is authorized may be stowed above or below the weather deck.

§ 176.78 Use of power-operated industrial trucks on board vessels.

(a) A power-operated truck (including a power-operated tractor, forklift, or other specialized truck used for cargo handling) may not be used on board a vessel in a space containing a hazardous material unless the truck complies with the requirements of this section.

(b) Each truck must have a specific designation of Underwriter's Laboratories or Factory Mutual Laboratories. Any repair or alteration to a truck must be equivalent to that required on the original designation.

(c) *Description of designations.* The recognized testing laboratory type designations are as follows:

(1) An "E" designated unit is an electrically-powered unit that has minimum acceptable safeguards against inherent fire hazards.

(2) An "EE" designated unit is an electrically-powered unit that has, in addition to all the requirements for the "E" unit, the electric motor and all other electrical equipment completely enclosed.

(3) An "EX" designated unit is an electrically-powered unit that differs from the "E" and "EE" unit in that the electrical fittings and equipment are so designed, constructed, and assembled that the unit may be used in certain atmospheres containing flammable vapors or dusts.

(4) A "G" designated unit is a gasoline-powered unit having minimum acceptable safeguards against inherent fire hazards.

(5) A "GS" designated unit is a gasoline-powered unit that is provided with additional safeguards to the exhaust, fuel, and electrical systems.

(6) An "LP" designated unit is similar to a "G" unit except that it is powered by liquefied petroleum gas instead of gasoline.

(7) An "LPS" designated unit is a unit similar to a "GS" unit except that liquefied petroleum gas is used for fuel instead of gasoline.

(8) A "D" designated unit is a unit similar to a "G" unit except that it is powered by a diesel engine instead of a gasoline engine.

(9) A "DS" designated unit is a unit powered by a diesel engine provided with additional safeguards to the exhaust, fuel, and electrical systems.

(d) *Explosives.* A truck may not be used in a hold or compartment containing explosives unless its use is approved by the Commandant (G-MTH).

In a space in which packaged small arms ammunition without explosive bullets is stowed, a power operated truck (except "E," "G," or "LP") may be used if approved by the local Captain of the Port.

(e) *Other hazardous materials.* (1) Only an "EX", "EE", "GS", "LPS", or "DS" truck may be used in a hold or compartment containing flammable liquids, flammable compressed gases, flammable solids, oxidizers, organic peroxides, articles of a fibrous nature, or bulk sulfur.

(2) Only a designated truck may be used to handle any other hazardous material not covered in paragraph (d) or (e)(1) of this section.

(f) *Minimum safety features.* In addition to the construction and design safety features required, each truck must have at least the following minimum safety features:

(1) The truck must be equipped with a warning horn, whistle, gong, or other device that may be heard clearly above normal shipboard noises.

(2) When the truck operation may expose the operator to danger from a falling object, the truck must be equipped with a driver's overhead guard. When the overall height of the truck with forks in the lowered position is limited by head room the overhead guard may be omitted. This overhead guard is only intended to offer protection from impact of small packages, boxes, bagged material, or similar hazards.

(3) A fork lift truck which handles small objects or unstable loads must be equipped with a load backrest extension having height, width, and strength sufficient to prevent any load, or part of it, from falling toward the mast is in a position of maximum backward tilt. It must be constructed in a manner that does not interfere with good visibility.

(4) The forks on a fork lift truck must be secured to the carriage so as to prevent any unintentional lifting of the toe which could create a hazard. The forks may not display permanent deformation when subjected to a test load of three times the rated capacity.

(5) Each fork extension or other attachment must be secured to prevent unintentional lifting or displacement on primary forks.

(6) Tires extending beyond the confines of the truck shall be provided with a guard to prevent the tires from throwing particles at the operator.

(7) Unless the steering mechanism is a type that prevents road reactions from causing the steering handwheel to spin, a mushroom type steering knob must be used to engage the palm of the operator's hand, or the steering mechanism must be arranged in some other manner to prevent injury. The knob must be mounted within the perimeter of the wheel.

(8) All steering controls must be confined within the clearnace of the truck or guarded so that movement of the controls will not result in injury to the operator when passing stanchions, obstructions or other.

(g) *Special operating conditions.* (1) A truck may not be used on board a vessel unless prior notification of its use is given to the master or senior deck officer on board.

(2) Before a truck is operated on board a vessel, it must be in a safe operating condition as determined by the master or senior deck officer on board.

(3) Any truck that emits sparks or flames from the exhaust system must immediately be removed from service and may not be returned to service until the cause of these sparks or flames has been eliminated.

(4) A truck may not be operated on board a vessel when the temperature of any part of the truck is found to be in excess of a safe operating temperature.

(5) All truck motors must be shut off immediately when an emergency condition arises on board a vessel.

(6) All truck motors must be shut off immediately when a breakage or leakage of packages containing flammable liquids or gases, flammable solids, oxidizers, or organic peroxides occurs or is discovered.

(7) The rated capacity of the truck must be posted on the truck at all times in a conspicuous place. This capacity may not be exceeded.

(8) At least one Coast Guard approved marine type size 1 Type B, or UL approved 5BC portable fire extinguisher, or its approved equivalent,

must be affixed to the truck in a readily accessible position or must be kept in close proximity, available for immediate use.

(9) The vessel's fire fighting equipment, both fixed (where installed) and portable, must be kept ready for immediate use in the vicinity of the space being worked.

(h) *Refueling.* (1) A truck using gasoline as fuel may not be refueled in the hold or on the weather deck of a vessel unless a portable non-spilling fuel handling system of not over five gallons capacity is used. Gasoline may not be transferred to a portable non-spilling fuel handling device on board the vessel.

(2) A truck using liquefied petroleum gas as fuel may not be refueled in the hold or on the weather deck of a vessel unless it is fitted with a removable tank and the hand-operated shutoff valve of the depleted tank is closed. In addition, the motor must be run until it stalls from lack of fuel and then the hand-operated shut off valve closed before the quick disconnect fitting to the fuel tank is disconnected.

(3) A truck using diesel oil as fuel may not be refueled on the weather deck or in the hold of a vessel unless a portable container of not over a five gallon capacity is used. A truck may be refueled or a portable container may be refilled from a larger container of diesel fuel on the weather deck of a vessel if a suitable pump is used for the transfer operation and a drip pan of adequate size is used to prevent any dripping of fuel on the deck.

(4) Refueling must be performed under the direct supervision of an experienced and responsible person specifically designated for this duty by the person in charge of the loading or unloading of the vessel.

(5) Refueling may not be undertaken with less than two persons specifically assigned and present for the complete operation, at least one of whom must be experienced in using the portable fire extinguishers required in the fuel area.

(6) At least one Coast Guard approved marine type size 1 Type B or UL approved 5BC portable fire extinguisher or its approved equivalent, must be provided in the fueling area. This is in addition to the extinguisher required by paragraph (g)(8) of this section.

(7) The location for refueling trucks must be designated by the master or senior deck officer on board the vessel. "NO SMOKING" signs must be conspicuously posted in the area.

(8) The location designated for refueling must be adequately ventilated to insure against accumulation of any hazardous concentration of vapors. When a truck is being refueled, the ventilation requirements of § 176.79 apply.

(9) Before any truck in a hold is refueled or before any fuel handling device or unmounted liquefied petroleum gas cylinder is placed in a hold, the motors of all trucks in the same hold must be stopped.

(10) All fuel handling devices and unmounted liquefied petroleum gas containers must be removed from a hold before any truck motor is started and the trucks are placed in operation in that hold.

(i) *Replacing batteries.* Batteries for electrically powered trucks and for the ignition systems of internal combustion powered trucks may be changed in the hold of a vessel subject to the following conditions:

(1) Only suitable handling equipment may be employed.

(2) Adequate precautions must be taken to avoid damage to the battery, short circuiting of the battery, and spillage of the electrolyte.

(j) *Charging of batteries.* Batteries of industrial trucks may be recharged in a hold of a vessel subject to the following conditions:

(1) The batteries must be housed in a suitable, ventilated, portable metal container with a suitable outlet at the top for connection of a portable air hose, or must be placed directly beneath a suitable outlet at the top for connection of a portable air hose. The air hose must be permanently connected to an exhaust duct leading to the open deck and terminate in a gooseneck or other suitable weather head. If natural ventilation is not practicable or adequate, mechanical means of exhaust must be employed in conjunction with the duct. The air outlet on the battery container must be

equipped with an interlock switch so arranged that the charging of the battery cannot take place unless the air hose is properly connected to the box.

(2) If mechanical ventilation is used, an additional interlock must be provided between the fan and the charging circuit so that the fan must be in operation in order to complete the charging circuit for operation. It is preferable that this interlock switch be of a centrifugal type driven by the fan shaft.

(3) The hold may not contain any hazardous materials.

(4) The charging facilities may be part of the truck equipment or may be separate from the truck and located inside or outside the cargo hold. The power supply or charging circuit (whichever method is used) must be connected to the truck by a portable plug connection of the break-away type. This portable plug must be so engaged with the truck battery charging outlet that any movement of the truck away from the charging station will break the connection between the plug and receptacle without exposing any live parts to contact with a conducting surface or object and without the plug falling to the deck where it may become subject to damage.

(5) All unmounted batteries must be suitably protected or removed from an area in the hold of the vessel before any truck is operated in that area.

(k) *Stowage of power-operated industrial trucks on board a vessel.* (1) Trucks may be stowed in any location on board a vessel subject to the following conditions:

(i) Each gasoline-powered truck must have all the fuel expended from the fuel system.

(ii) Each liquefied petroleum gas-operated truck must have the fuel tank removed and all the fuel expended from the fuel system.

(2) Any truck not meeting the conditions set forth in paragraph (k)(1) of this section must be stowed on the open deck except for intervals such as lunch hours, between work shifts, and interdock and intraport movements. If a truck is stowed in a fixed metal enclosure located on or above the weather deck, this enclosure must have access from the weather deck only and must have adequate ventilation arranged to remove vapors from both the upper and lower portions of the space.

(l) *Packaging and stowage of fuel on board a vessel.* (1) *Packaging.* Flammable liquids and gases to be used as fuels for trucks must be packaged in DOT specification containers, A.S.M.E. containers, or portable safety containers approved by a recognized testing laboratory and authorized for the contents.

(2) *Marking and labeling.* The appropriate DOT label must be affixed to each container of flammable liquid or flammable gas.

(3) *Stowage.* Each container must be stowed on or above the weather deck as designated by the master. However, a DOT specification container, A.S.M.E. container, or portable safety container having a capacity of five gallons or less and approved by a recognized testing laboratory may be stowed below deck in a paint locker and diesel fuel may be stowed in any location designated by the master.

[Amdt. 176-1, 41 FR 16110, Apr. 15, 1976, as amended by Amdt. 176-1A, 41 FR 40687, Sept. 20, 1976; Amdt. 176-21, 50 FR 11055, Mar. 19, 1985]

§ 176.79 Spaces exposed to carbon monoxide or other hazardous vapors.

When hazardous materials are transported by vessel in an enclosed space which is exposed to carbon monoxide or other hazardous vapors from exhausts of power-operated industrial trucks or other mechanized equipment, the space must be provided with adequate ventilation to prevent the accumulation of dangerous vapors. The senior deck officer shall insure that a test of the carbon monoxide content of the atmosphere is made as frequently as conditions require to detect the presence of any dangerous concentration of vapors in areas where persons may be working. The test must be made by a person acquainted with the test equipment and procedure. The carbon monoxide concentration in any hold or intermediate deck where any person is working may not exceed 50 parts per million (0.005 percent) as a time weighted average. Persons may not be permitted to remain in any hold or intermediate deck where the concentration exceeds 75 parts per million (0.0075 percent). Portable blowers of adequate size and location may be used to remove any vapors not removed by installed ventilation systems.

Subpart D—General Segregation Requirements

§ 176.80 Application.

(a) This subpart sets forth segregation requirements in addition to any segregation requirements set forth elsewhere in this subchapter.

(b) Hazardous materials in limited quantities when loaded in transport vehicles and freight containers, are excepted from the segregation requirements of this subpart and any additional segregation specified in this subchapter for transportation by vessel.

[Amdt. 176-1, 41 FR 16110, Apr. 15, 1976, as amended by Amdt. 176-3, 42 FR 57967, Nov. 7, 1977]

§ 176.83 Segregation requirements for cargo vessels and passenger vessels.

(a) The following table (Table I) specifies the categories of explosives which may not be loaded or stowed together within the same hold or compartment. The letter "X" at an intersection of a horizontal and vertical column indicates that these categories may not be stowed together in the same hold or compartment.

(b) The following table (Table II) specifies the minimum separation requirements that apply when transporting different classes of hazardous materials on board a vessel, other than a ferry vessel. The symbols used in the table below mean the following:

(1) "1"—Away from.

(2) "2"—Separated from.

(3) "3"—Separated by a complete cargo compartment or hold from.

(4) "4"—Separated longitudinally by an intervening complete cargo compartment or hold from.

(5) "0"—No general segregation specified; individual entries in the Hazardous Material Table in § 172.101 of this subchapter should be consulted.

(6) "*"—Consult Table I of this section for segregation requirements between different explosives.

(c) *Definition of terms.*

(1) *Legend.*

(i) Reference package * * *

▬

(ii) Incompatible package * * *

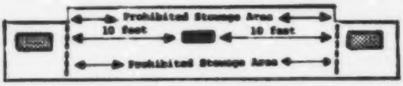
▭

(iii) Deck resistant to liquid and fire * * *

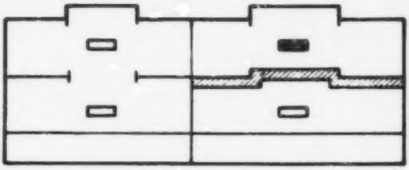
▨

NOTE: Solid vertical lines represent transverse watertight bulkheads between holds.

(2) *Away from.* "Away from" means effectively segregated so that materials may not interact dangerously in the event of an accident. These materials may be stowed in the same cargo compartment, hold, deck area or barge provided a minimum horizontal separation of 10 feet, projected vertically, is provided.



(3) *Separate from.* (i) "Separate from" means in separate holds when stowed "under deck". If the intervening deck is resistant to fire and liquid, a vertical separation, i.e., in different cargo compartments, is considered equivalent to this requirement. For "on deck" stowage, "away from" segregation is authorized.



(ii) On barge-carrying vessels, separate barges are required if the barges are constructed of steel. Otherwise separate holds are required.

Segregation and Separation Chart of Hazardous Materials — Table I

Footnotes

1/ Explosives, class A, and explosives, class B, must not be loaded or stowed with chemical ammunition containing incendiary charges or white phosphorus either with or without bursting charges. Chemical ammunition of the same classification containing incendiary or white phosphorus may be loaded and stowed together.

2/ Boosters (explosive), bursters (explosive), or supplementary charges (explosive) without detonators when shipped by, to, or for the Department's of the Army, Navy, and Air Force of the United States Government may be stowed with any of the articles named, except those in columns 3, 4, 10 and 16.

3/ Detonating cord transported as class C explosive under provisions of §173.81(c) of this subchapter shall, as a minimum, be stowed "Separated from" other consignments of detonating cord.

Instructions

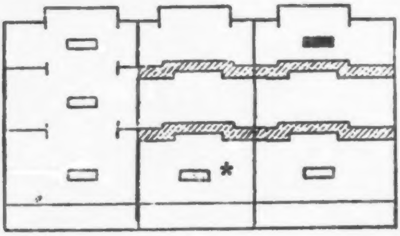
The letter X at an intersection of horizontal rows and vertical columns shows that these materials must not be loaded or stowed together.

			18	17	16	15a	15	14a	14	13	12	11	10	9	8	7	6	5	4	3	2	1
CLASS A EXPLOSIVES	Low explosives or black powder	1																				
	High explosives, propellant explosives or detonating cord 3/	2																				
	Initiating or priming explosives, wet: Diazodinitrophenol, fulminate of mercury, guanyl nitrosamino guanylidene hydrazine, lead azide, lead styphnate, nitro mannite, nitrosoguanidine, pentaerythrite tetranitrate, tetrazene, lead mononitroresorcinate	3																			X	X
	Detonators, detonating primers	4																		X	X	
	Ammunition for cannon with explosive projectiles, gas projectiles, smoke projectiles, incendiary projectiles, illuminating projectiles, ammunition for small-arms with incendiary projectiles, ammunition for small-arms with explosive projectiles, rocket ammunition with explosive projectiles, gas projectiles, smoke projectiles, incendiary projectiles, illuminating projectiles 1/, boosters (explosive), bursters (explosive), and supplementary charges (explosive) without detonators 2/	5																	X	X		
	Explosive projectiles, bombs, torpedoes, mines, rifle or hand grenades (explosive), jet thrust units (jato), igniters, jet thrust, rocket motors, igniters rocket motor	6																	X	X		
	Detonating fuzes, class A explosives, with or without radioactive components	7															X	X		X	X	
CLASS B EXPLOSIVES	Ammunition for cannon with empty, inert-loaded or solid projectiles, or without projectiles, rocket ammunition with empty, inert-loaded or solid projectiles	8																		X		
	Propellant explosives, jet thrust units (jato), igniters, jet thrust, rocket motors, rocket engines (liquid), igniters, rocket motor, starter cartridges, jet engine	9																		X		
	Fireworks, special or railway torpedoes	10														X	X	X	X	X	X	X
CLASS C EXPLOSIVES	Small arms ammunition, or cartridges, practice ammunition	11																		X		
	Primers for cannon or small arms, empty cartridge bags—black powder igniters, empty cartridge cases, primed, empty grenades, primed, combination primers or percussion caps, toy caps, explosive cable cutters, explosive rivets	12																		X		
	Percussion fuzes, tracer fuzes or tracers	13																		X		
	Time, combination or detonating fuzes	14																		X		
	Detonators, detonating primers	14a											X				X	X		X	X	
	Safety squibs, fuse lighters, fuse igniters, delay electric igniters, electric squibs, instantaneous fuse or igniter cord	15																		X		
	Detonating cord	15a						X					X			X			X	X		
	Fireworks, common	16				X										X	X	X	X	X	X	X
BLASTING AGENTS	Blasting agents, n.o.s.	17						X					X			X			X	X		
	Ammonium nitrate-fuel oil mixtures	18						X					X			X			X	X		

TABLE II

		1(A)	1(B)	1(C)	2(A)	2(B)	3	4(A)	4(B)	4(C)	5(A)	5(B)	6(A)	6(B)	7	8	9
EXPLOSIVES A	1(A)	•	•	•	4	2	4	4	4	4	4	4	2	2	2	4	0
EXPLOSIVES B	1(B)	•	•	•	4	2	4	3	3	4	4	4	2	2	2	2	0
EXPLOSIVES C, BLASTING AGENTS	1(C)	•	•	•	2	1	2	2	2	2	2	2	1	0	2	2	0
FLAMMABLE COMPRESSED GASES	2(A)	4	4	2	....	0	2	1	2	1	2	4	0	0	2	1	0
NONFLAMMABLE COMPRESSED GASES	2(B)	2	2	1	0	....	2	0	1	0	0	2	0	0	1	0	0
FLAMMABLE OR COMBUSTIBLE LIQUIDS	3	4	4	2	2	2	....	2	2	2	2	3	2	0	2	1	0
FLAMMABLE SOLIDS	4(A)	4	3	2	1	0	2	....	1	1	1	2	0	0	2	1	0
FLAMMABLE SOLIDS LABELED SPONTANEOUSLY COMBUSTIBLE	4(B)	4	3	2	2	1	2	1	....	1	2	2	1	0	2	1	0
FLAMMABLE SOLIDS LABELED DANGEROUS WHEN WET	4(C)	4	4	2	1	0	2	1	1	....	2	2	0	0	2	1	0
OXIDIZERS	5(A)	4	4	2	2	0	2	1	2	2	....	2	0	1	1	2	0
ORGANIC PEROXIDES	5(B)	4	4	2	4	2	3	2	2	2	2	....	2	1	2	2	0
CLASS A POISONS	6(A)	2	2	1	0	0	2	0	1	0	0	2	....	0	1	0	0
CLASS B POISONS OR IRRITATING MATERIALS	6(B)	2	2	0	0	0	0	0	0	0	1	1	0	....	0	0	0
RADIOACTIVE MATERIALS	7	2	2	2	2	1	2	2	2	2	1	2	1	0	....	2	0
CORROSIVE MATERIALS	8	4	2	2	1	0	1	1	1	1	2	2	0	0	2	....	0
OTHER REGULATED (ORM) MATERIALS	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	....

(4) *Separate by a complete cargo compartment or hold from.* (i) "Separate by a complete cargo compartment or hold from" means either a vertical or horizontal separation. If the decks are not resistant to fire and liquid, a longitudinal separation by an intervening complete cargo compartment is required. For "on deck" stowage this segregation means a separation by a corresponding horizontal distance.



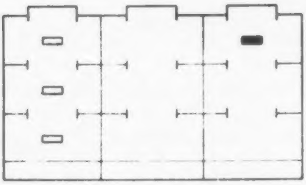
* When the stowage location of the incompatible package is in this relation to the reference package, at least one of the intervening decks in the vertical plane must be resistant to fire and liquid.

(ii) For barges aboard barge-carrying vessels, the following requirements apply:

(A) For barges loaded on ships having vertical holds, separate barge holds are required.

(B) For barges loaded on ships having horizontal barge levels, separate barge levels are required.

(5) *Separate longitudinally by an intervening complete cargo compartment or hold or engine room from.* (i) "Separate longitudinally by an intervening complete cargo compartment or hold or engine room from" means a horizontal separation by a complete intervening hold (two intervening bulkheads) or engine room. Vertical separation alone does not meet this requirement. For "on deck" stowage, this segregation means a separation by the vessel's bridge or superstructure:



(ii) For barges aboard barge-carrying vessels the following requirements apply:

(A) For barges loaded on ships having vertical holds, separation by an intervening barge hold or engine room is required.

(B) For barges loaded on ships having horizontal barge levels, separate barge levels and a longitudinal separation by at least two intervening barges are required.

(d) In applying the minimum separation requirements specified in Table II to freight containers containing hazardous materials, the following additional requirements apply:

(1) *Class segregation.* Materials for which any segregation is specified in Table II may not be stowed in the same freight container.

(2) *Vertical stowage requirements.* Freight containers either closed or open may not be stowed in the same vertical line when segregation is required unless separated by a deck resistant to fire and liquid. When a solid substance is required to be stowed "Away from" another substance, it may be stowed above the other provided a minimum distance of eight feet intervenes. When "Separate by a complete cargo compartment or hold from" is required, freight containers separated by a deck resistant to fire and liquid may not be stowed in the same vertical line unless two such decks intervene.

(3) *Horizontal stowage requirements.* (i) "Away from":

(A) For closed freight containers stowed on or under deck there are no restrictions in regard to freight container location in relation to other freight containers.

(B) For open containers stowed on or under deck, a minimum separation of 20 feet must be provided in the fore and aft direction unless separated by a bulkhead resistant to fire and water or a minimum athwartships separation of 8 feet must be provided.

(ii) "Separated from"—(A) For closed freight containers on or under deck a fore and aft separation of at least 20 feet must be provided unless separated by a bulkhead resistant to fire and water or a minimum athwartships separation of 16 feet must be provided.

(B) For open freight containers stowed on deck a minimum separation of 20 feet must be provided in the fore and aft direction or a minimum separation of 16 feet must be provided in the athwartships direction.

(C) Open freight containers stowed under deck must be separated by a bulkhead resistant to fire and water.

(iii) "Separate by a complete cargo compartment or hold from":

(A) For closed or open freight containers on deck a minimum separation of 20 feet must be provided in the fore and aft direction or a minimum separation of 24 feet must be provided in the athwartships direction.

(B) Closed freight containers under deck must be segregated by one bulkhead resistant to fire and water.

(C) Open freight containers under deck must be segregated by two bulkbulkheads resistant to fire and water.

(iv) "Separated longitudinally by an intervening complete cargo compartment or hold from":

(A) Closed or open freight containers on deck must be separated by a distance of 80 feet.

(B) Closed freight containers under deck must be separated by at least two bulkheads resistant to fire and water or one bulkhead resistant to fire and water and a total distance of at least 80 feet provided the containers are not stowed less than 20 feet from the intervening bulkhead.

(C) Open freight containers under deck must be separated by at least two bulkheads resistant to fire and water.

(e) In applying the minimum separation requirements specified in Table II to portable tanks and railroad and highway vehicles containing hazardous materials, paragraph (d) of this section pertaining to freight containers applies.

(f) A ferry vessel (when operating either as a passenger or cargo vessel) which cannot provide the type of separation required in this section may carry incompatible hazardous materials in separate highway or railroad vehicles if they are stowed to give the maximum possible separation.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 176-1, 41 FR 16110, Apr. 15, 1976]

EDITORIAL NOTE: For Federal Register citations affecting § 176.83, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

Subpart E—Special Requirements for Transport Vehicles Loaded With Hazardous Materials and Transported on Board Ferry Vessels

§ 176.88 Application.

The requirements in this subpart are applicable to transport vehicles containing hazardous materials being transported on board ferry vessels and are in addition to any prescribed elsewhere in this subchapter. Vessels in a service similar to a ferry service, but not over a designated ferry route, may be treated as a ferry vessel for the purpose of this subpart if approved in writing by the District Commander.

[Amdt. 176-1, 41 FR 16110, Apr. 15, 1976, as amended by Amdt. 176-1A, 41 FR 40690, Sept. 20, 1976]

§ 176.89 Control of transport vehicles.

(a) A transport vehicle containing hazardous materials may be transported on board a ferry vessel, subject to the following conditions:

(1) The operator or person in charge of the vehicle shall deliver to the vessel's representative a copy of the shipping papers and certificate required by §§ 176.24 and 176.27;

(2) The vehicle shall be placed at the location indicated by the vessel's representative;

(3) The parking brakes of the vehicle shall be set securely to prevent movement;

(4) The motor of a highway vehicle shall be shut off and not restarted until the vessel has completed its voyage and docked;

(5) All vehicle lights shall be cut off and not relighted until the vessel has completed its voyage and docked;

(6) The operator of a highway vehicle shall remain with the vehicle;

(7) No repairs or adjustments must be made to the vehicle while it is on the vessel;

(8) No hazardous materials are to be released from the vehicle; and

(9) Any instructions given by the vessel's representative during the voyage, and during "roll on" and "roll off" operations must be observed.

(b) Smoking by any person in or around a vehicle is prohibited.

§ 176.90 Private automobiles.

A private automobile which is carrying any explosive (except permitted fireworks or small arms ammunition) may not be transported on a passenger-carrying ferry vessel unless the explosive is in compliance with packaging, labeling, marking, and certification requirements of this subchapter. Permitted fireworks and small arms ammunition may be carried without the required packaging, labeling, marking, or certification if they are in tight containers.

§ 176.91 Motorboats.

A motorboat may be transported on board a ferry vessel with gasoline in the tank and two other containers not exceeding six gallons capacity each if they are in the motorboat, closed, and in good condition.

§ 176.92 Cylinders laden in vehicles.

Any cylinder of compressed gas which is required to have a valve protection cap fitted in place may be transported on board a ferry vessel without having the valve protection cap in place when it is laden in a transport vehicle and is not removed from the vehicle while on the vessel.

§ 176.93 Vehicles having refrigerating or heating equipment.

(a) A transport vehicle fitted with refrigerating or heating equipment using a flammable liquid or gas, or diesel oil as fuel, may be transported on a ferry vessel. However, the refrigerating or heating equipment may not be operated while the vehicle is on the vessel, unless the equipment complies with the following requirements:

(1) The installation is rigidly mounted and free of any movement other than normal vibration in operation;

(2) An easily accessible shutoff control is fitted to the fuel and electrical supply of the refrigerating or heating equipment; and

(3) The fuel storage tank, the fuel lines, the carburetor and any other fuel devices are tight and show no signs of leakage.

(b) If the vehicle operator desires to operate the refrigerating or heating equipment while on the vessel and the equipment is not fitted with automatic starting and stopping devices, it must be started before the vehicle is taken on board. It may continue in operation while the vehicle is on the vessel, but if the motor stops it may not be restarted.

(c) In the case of a ferry vessel on a voyage exceeding 30 minutes' duration, stowage must be provided for transport vehicles having refrigerating or heating equipment operated by internal combustion engines which will permit ready diffusion of exhaust gases to the open air. Passenger vehicles may not be stowed in a position adjacent to vehicles operating internal combustion motors which expose the occupants of the passenger vehicles to excessive concentrations of exhaust fumes from such motors.

(d) A transport vehicle containing solid carbon dioxide as a refrigerant may be transported on a ferry vessel only if it is stowed in a well ventilated location.

Subpart F—Special Requirements for Barges

AUTHORITY: 49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1.

SOURCE: Amdt. 176-8, 44 FR 23228, Apr. 19, 1979, unless otherwise noted.

§ 176.95 Application.

The requirements prescribed in this subpart are applicable to the transportation of packaged hazardous materials on board barges. The requirements prescribed elsewhere in this subchapter for vessels similarly apply, except as provided in this subpart, to the transportation of packaged hazardous materials on board barges.

§ 176.96 Materials of construction.

Unless otherwise approved by the Commandant, U.S. Coast Guard (GMHM, Washington, D.C., 202-426-1577) only barges constructed of steel are permitted to carry hazardous materials.

§ 176.97 Prohibition of dump scows.

Dump scows are barges having cargo carrying compartments of the hopper type and fitted with a bottom dump or a side dump. This type of barge is prohibited from the carriage of any class of hazardous material.

§ 176.98 Stowage of hazardous materials on board barges.

A material for which "on deck" stowage only is required by Column (7) of the Hazardous Materials Table (§ 172.101 of this subchapter) may be stowed "under deck" on unmanned barges.

§ 176.99 Permit requirements for certain hazardous materials.

The permits required by §§ 176.100 and 176.415 for loading, unloading, and handling Class A Explosives, blasting agents, and certain ammonium nitrates must be obtained when these materials are loaded on, unloaded from, or handled on board a barge or barge carrying vessel. However, a barge loaded with these materials being placed on, removed from, or handled on board a barge carrying vessel is not subject to these permit requirements.

Subpart G—Detailed Requirements for Explosives

§ 176.100 Permit for Class A explosives.

Before a shipment of Class A explosives may be discharged from, loaded on, handled, or restowed on board a vessel at any place in the United States, its territories, or its possessions (except the Panama Canal Zone), the carrier must obtain a permit from the Captain of the Port or his authorized representative. Exceptions to this permit requirement may be given only by the Captain of the Port or his authorized representative.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 176-8, 44 FR 23229, Apr. 19, 1979]

§ 176.105 Loading and unloading explosives.

(a) In any particular port, Class A or Class B explosives (except special fireworks), may not be loaded on a vessel until all other cargo has been loaded on board the vessel. No explosives may be loaded or unloaded at the same time that other cargo is being handled.

(b) All explosives must be handled carefully. Packages of explosives may not be thrown, dropped, rolled, dragged, or slid over each other or over a deck.

(c) Packaged Class A explosives must be loaded and discharged from a vessel by using a chute as provided for in § 176.163 or by a mechanical pallet, skipboard, tray or pie plate, fitted with a cargo net or sideboards. A stuffed mattress at least 4 feet wide by 6 feet long and not less than 4 inches thick, or a heavy jute or hemp mat of these dimensions, must be used for depositing explosives lifted by mechanical means or slid on a chute. The maximum load handled in a pallet, shipboard, tray, or pie plate may not exceed 2,640 pounds. A rope net sling with a pallet, skidboard, pie plate or similar base must be loaded so that a minimum displacement of items occurs when it is lifted; the cargo net must completely encompass the cotton and sides of the load. Not more than one-third of the vertical dimension of any package may extend above the sideboard of a tray. A landing mattress and cargo net are not needed for palletized Class A explosives.

(d) Detonators, detonating primers, detonating fuzes, fulminate of mercury, and other initiating or priming explosives defined in this subchapter constitute distinct types of explosives. They must be handled with extreme care. A chute and mattress may not be used when loading or discharging this type of explosive.

(e) A "can" hook may not be used for raising or lowering a barrel, drum, or other container of explosives.

(f) A fire hose of sufficient length to cover the area of the loading operation and connected with an adequate water supply must be laid out and ready for use.

[Amdt. 176-1, 41 FR 16110, Apr. 15, 1976, as amended by Amdt. 176-1A, 41 FR 40690, Sept. 20, 1976; Amdt. 176-10, 44 FR 70732, Dec. 10, 1979]

§ 176.110 Condition of package.

A package of an explosive which is damp, moldy, stained or in any condition that indicates leakage may not be transported by vessel. The shipper must substantiate any claim that a stain is due to accidental contact with grease, oil, or a similar substance. In case of doubt, the package may not be transported.

§ 176.115 On deck stowage of explosives.

(a) The following requirements apply to the stowage of explosives on deck:

(1) An explosive may not be stowed on or under a bridge deck.

(2) An explosive may not be stowed nearer than 25 feet in a horizontal plane to the crew's quarters.

(b) Explosives being transported on deck on a vessel between receiving points and delivery points within the same harbor, bay, sound, lake, or river including explosive anchorages must be covered with a fire resistant or flame-proof tarpaulin securely lashed in place.

§ 176.120 Preparation of decks, gangways, hatches, and cargo ports.

(a) All decks, gangways, and hatches over or through which explosives must be passed or handled in loading or unloading must be freed of all loose material and must be swept broom clean before loading and unloading.

(b) All hatches and cargo ports opening into a compartment in which any explosives are stowed must be kept closed, except during loading or unloading of the compartment. After loading, hatches must be securely closed against the weather. If tarpaulins are used, they must be securely battened.

§ 176.125 Handling over deck loads on break-bulk vessels.

A deck load over which explosives must be passed may not exceed the height of the hatch coaming, bulwark, or three feet, whichever is greater.

§ 176.130 Securing and dunnaging of packages of explosives.

(a) Each package of explosives must be secured and dunnaged to prevent movement in any direction. Vertical restraints are not required if the shape of the package and the stuffing pattern precludes shifting of the load.

(b) Each keg of black powder must be stowed in an upright position with the bungs up and each tier must be completely dunnaged.

(c) Each package of explosives must be braced and dunnaged so that it is not likely to be pierced by the dunnaging or crushed by any superimposed weight.

§ 176.135 Location of magazines.

(a) Each magazine must be located in a hold, preferably a 'tween deck hold, that is dry and well ventilated. It may not be located in horizontal proximity to crew or passenger accommodations or below their living spaces. A magazine may not be built on or under the principal bridge structure or any navigation spaces. Except for inspection purposes, the hold or compartment in which a magazine is constructed must be closed off to all traffic after the explosives are stowed.

(b) A magazine may not be constructed in contact with a collision bulkhead or a bulkhead forming a boiler room, engine room, coal bunker or galley boundary unless there is no practicable alternative. If it is necessary to construct a magazine contacting one of these bulkheads, a cofferdam space of at least one foot must be provided between the permanent bulkhead and the magazine bulkhead. The cofferdam space must remain open to the free circulation of air and may not be used for stowage or storage purposes.

(c) When a magazine is constructed over a 'tween deck hatch, the hatch girders or strongbacks and the hatch covers forming the 'tween deck hatch must be of a design and size to carry the imposed load with safety. Covers of the 'tween deck and over-deck hatch must completely close the hatch opening and fit securely in place. 'Tween deck hatch covers of wood forming the base of a magazine must be completely covered with asbestos board at least ¼-inch thick, fitted tight at the sides of the magazine. The joints of the asbestos board must be staggered midway between the joints formed by the wooden hatch covers and the magazine must be constructed in accordance with the applicable provisions of § 176.138, except that the asbestos board must be completely covered with wood dunnage. No metal structural parts may protrude within any magazine. If the stowage of explosives extends into the over-deck hatch coaming, this coaming must be sheathed with wood. A magazine located in a hatchway may be constructed to occupy only a part of the hatchway. A portable magazine may be stowed in the square of a hatchway; it must be lashed or tommed to prevent movement.

(d) Any construction and location of a magazine for the stowage of explosives other than as provided in this subpart may be authorized only by the Commandant, (G-MTH).

[Amdt. 176-1, 41 FR 16110, Apr. 15, 1976, as amended by Amdt. 176-1A, 41 FR 40690, Sept. 20, 1976; Amdt. 176-21, 50 FR 11055, Mar. 19, 1985]

§ 176.138 Construction of magazines.

(a) All magazine construction, and other conditioning of holds, deck, or hatches on a vessel, must be completed before the actual loading of explosives on that vessel is initiated.

(b) The following requirements must be observed in the construction of a magazine for stowage of explosives requiring magazine stowage:

(1) Each magazine must be constructed of steel or wood;

(2) Each magazine constructed of steel must have the interior completely protected by wood sheathing not less than ¾-inch thick to form a smooth surface free of any projections. All metal stanchions within the magazine must be boxed with wood not less than ¾-inch thick. When the floor of a magazine would be on a steel deck or tank top, a floor of wood not less than 1¼-inch commercial lumber, constructed on bearers, must be installed. This floor may be portable, but must be tight to prevent movement;

(3) Each magazine constructed of wood must have the bulkheads forming the sides and ends constructed of 1-inch lumber, ¾-inch tongue and groove sheathing, or ¾-inch plywood, secured to uprights of at least 3- by 4-inch size, spaced not more than 18 inches apart and secured at the top, bottom, and center with horizontal bracing. When ¾-inch plywood is used, the uprights may be spaced on 24-inch centers. Uprights may not be stepped directly to a metal deck. A 2- by 4-inch header must be fitted against the underside of the overhead deck to receive the top of the uprights. Top of uprights fitted against channel beams may be wedged directly to the beam with 2- by 4-inch spacers fitted between. Upright framing must be secured so that nails do not penetrate the interior of the magazine. When a magazine is constructed as a permanent compartment in a vessel, increased size and finish of lumber and other methods of fastening may be used, provided all fastenings are recessed below the surface of the boarding to avoid any projections within the interior of the magazine. All boarding must be fitted and finished to form a smooth surface within the interior of the magazine.

(i) The construction must separate all containers of explosives from contact with metal surfaces of the structures of the vessel. When a metal stanchion, post, or other obstruction is located in the interior area of the magazine, this obstruction must be completely covered with wood at least ¾-inch thick secured with nails or screws. All screws or nails used in the interior of the magazine for fastening must be counter-sunk below the surface of the wood. Flooring of each magazine must be not less than 1¼-inch commercial lumber, constructed on bearers. This floor may be portable but must be tight to prevent movement. Each door of a magazine must be of substantial construction, fitted reasonably tight in its jamb, and provided with a locking method of a tamper-proof type. The door must be easily accessible;

(4) Plywood $\frac{5}{16}$-inch thick may be used if the bulkheads forming the sides of a magazine are to be constructed directly against the ship's side and battens are fitted, and if the plywood is securely fastened to vertical furring strips of not less than 1- by 3-inch material, spaced not more than 18 inches apart;

(5) A magazine constructed in accordance with the provisions of paragraphs (b) (2) and (3) of this section, in which it is proposed to stow containers of explosives within 12 inches of the overhead beams or hatch coaming must have such beams and coaming sheathed with wood as prescribed by the provisions of paragraph (b)(2) of this section for stanchions; and

(6) When a Class A explosive magazine exceeds 40 feet in any direction, a partition bulkhead must be fitted in the magazine as near half length as practicable, extending from the deck to at least the top of the stowage. This partition bulkhead must be constructed to the same scantlings as the sides of the magazine, except the boardings may be spaced not more than 6 inches apart alternately on both sides of the uprights. Nail points may not protrude beyond the surface of any boardings. The bulkhead must be constructed before loading commences. This bulkhead is not required when the explosives are palletized.

[Amdt. 176-1, 41 FR 16110, Apr. 15, 1976, as amended by Amdt. 176-1A, 41 FR 40690, Sept. 20, 1976]

§ 176.141 Entire hold or compartment forming magazine.

When a complete hold or compartment is used for the stowage of explosives requiring magazine stowage, the entire hold or compartment may be considered a magazine. Any frames or bulkhead stiffeners protruding into the hold or compartment must be effectively sheathed to provide a smooth surface. Overhead beams need not be sheathed when the explosives are stowed more than 12 inches from these beams. If explosives are stowed up to the overhead beams and in the square of the hatch formed by the coaming, the overhead beams, including the hatch coaming, must be effectively sheathed. The installation of sheathing must be in accordance with the specifications for the construction of a magazine. However, when cargo battens are fitted to the vessel's shell or a bulkhead forming part of the hold or compartment, the sheathing may be secured vertically to the battens.

§ 176.144 Ventilation of magazines.

Each magazine must be effectively ventilated. Each cowl ventilator's weather deck opening must be covered with a 30×30 or finer mesh wire screen, if it leads into a magazine or to an area in the same hold adjacent to a magazine. A magazine which occupied only a portion of a hold, and is not fitted with a ventilator entering into the magazine must be constructed to leave an open space of not more than one inch below the overhead frame.

[Amdt. 176-1, 41 FR 16110, Apr. 15, 1976, as amended by Amdt. 176-1A, 41 FR 40690, Sept. 20, 1976]

§ 176.147 Metal lockers for stowage of fireworks.

Each metal locker for the stowage of special fireworks which are permitted to be transported on board passenger vessels must meet the following requirements:

(a) *Size.* The cubic capacity of the locker may not exceed 150 cubic feet.

(b) *Division.* If the locker is more than 5 feet in height, it must be fitted with a division shelf at about ½ height constructed to carry the imposed load without deflection.

(c) *Gauge.* The thickness of steel used in the construction of the locker may not be less than 16 gauge steel.

(d) *Type of construction.* The locker must have a completely smooth interior surface. No stiffener element may project beyond any interior surface. The locker must be fitted with a top and bottom closure unless it is "built-in" to the structure of the vessel with the overhead and deck forming the top and bottom of the locker. "Built-in" construction is not authorized if the overdeck or underdeck is wood.

(e) *Closures.* Closures may be the removable plate or hinged door type if the locker is flame tight when closed. A locker having a portable plate closure must have an accessible side opening to permit insertion of a fire hose nozzle for flooding. The opening must be at least 3 inches in diameter, not more than 12 inches below the top of the locker, and fitted with a metal flap cover to preserve the flame tight requirement.

(f) *Location.* The locker must be readily accessible from a companionway or cargo hatch. In vessels constructed of wood, the locker must be easily observable by a watchman on his rounds. The locker must be secured to prevent shifting in a seaway.

§ 176.150 Portable magazines for stowage of explosives.

(a) Each portable magazine used for the stowage of explosives on board a vessel must meet the following requirements:

(1) It must be watertight, constructed of wood or of metal lined with wood at least ¾-inch thick and with a capacity of no more than 110 cubic feet.

(2) All inner surfaces must be smooth and free of any protruding nails, screws, or other projections.

(3) If constructed of wood, the scantlings and arrangement must be not less than those required by § 176.138. It must be provided with a strong close-fitting, hinged cover or door with hasps and padlock.

(4) When constructed of metal, the metal must not be less than ⅛-inch thick.

(5) Runners, bearers, or skids must be provided to elevate the magazine at least 4 inches from the deck. Pad eyes, ring bolts, or other suitable means must be provided for securing. The magazine must be lashed, chocked, or braced to prevent movement in any direction.

(6) The magazine must be stowed in the square of a 'tween deck hatch unless another stowage is authorized by § 176.155.

(7) The magazine must be marked on the top and four sides, in letters at least 3 inches high, as follows:

"EXPLOSIVES—HANDLE CAREFULLY—KEEP LIGHTS AND FIRE AWAY".

(b) A portable magazine may be used for the stowage of explosives exceeding 110 cubic feet under such conditions of construction, handling, and stowage that meet the approval of the Commandant (G-MTH).

[Amdt. 176-1, 41 FR 16110, Apr. 15, 1976, as amended by Amdt. 176-21, 50 FR 11055, Mar. 19, 1985]

§ 176.155 Stowage of small quantities of explosives.

(a) A District Commander may approve the stowage of small quantities of explosives in a location other than "under deck", such as in an isolated compartment, mast or deck house, or in a magazine (which may be portable) secured "on deck" if:

(1) No other stowage is available;

(2) The compartment or stowage area is sheathed with wood;

(3) The boundary of the compartment or magazine is at least 8 feet from the vessel's side; and

(4) The boundary of the explosives stowage area is separated from other incompatible explosives and other hazardous materials by at least one permanent steel deck or bulkhead and a distance of 25 feet or by at least two steel decks or bulkheads and a distance of 10 feet. An intervening steel deck or bulkhead is not required on deck if the separation distance between these materials is not less than 40 feet in any direction.

§ 176.156 Stowage of explosives with combustible liquids.

Class A or B explosives may not be stowed in the same hold or compartment with combustible liquids.

§ 176.157 Stowage of explosives in holds containing coal.

An explosive may not be stowed in a hold containing coal or in a hold above or adjacent to a hold containing coal.

§ 176.158 Stowage of explosives with fireworks.

Fireworks may not be stowed in the same hold in which there is a magazine containing explosives.

§ 176.159 Stowage of explosives and nondangerous cargo.

Each magazine in which explosives are stowed must be protected from damage which may be caused by any heavy cargo stowed in the same hold. When any shafting, steel bar, pipe, heavy machinery, or similar type of cargo is stowed in the same hold with explosives, it must be isolated, dunnaged, or secured to prevent damage to the magazine under any conditions likely to be encountered during the voyage.

§ 176.163 Requirements of equipment for handling explosives.

(a) A chute for loading and unloading explosives must be constructed of smooth planed boards not less than one inch thick with side guards of the same material at least 4 inches high. Only brass screws may be used to assemble the sides and bottom. D-shaped wooden strips or runners not more than six inches apart and running the length of the chute must be fastened to the upper surface of the slide by glue and wooden dowels extended through the bottom of the chute. Four lashing rings must be provided, one at each outside corner of the chute, for purposes of securing during use.

(b) A roller conveyor constructed of aluminum or other non-sparking material may be used for loading or unloading explosives. The conveyor must be grounded when in use.

(c) A powered conveyor may be used only after the design, construction, and specifications have been approved by the Commandant (G-MTH).

(d) Before any explosives are loaded or unloaded from a vessel, the master of the vessel must examine the condition and working order of all slings, carts, baskets, boxes, chutes, mattresses, tackle and other equipment to be used in the transfer operation. This includes equipment belonging to the vessel, stevedores, and any contractors.

(e) Any equipment which in the judgment of the master of the vessel is not in a safe working condition must be rejected. He shall prohibit its use and take the precautions necessary to ensure that the rejected equipment is not used to load or unload explosives. The master of the vessel shall ensure that all equipment used in the handling of explosives is in good working order. If any part of the equipment shows any defect or is damaged in use, work must be stopped immediately and the damaged or defective equipment repaired or replaced before permitting the loading or unloading to continue.

[Amdt. 176-1, 41 FR 16110, Apr. 15, 1976, as amended by Amdt. 176-21, 50 FR 11055, Mar. 19, 1985]

§ 176.165 Installation of loading chute and roller conveyor.

A chute or roller conveyer to be used in loading or unloading explosives may not be positioned or inclined in a manner which will permit any sliding package to violently strike any other package on or at the bottom of the chute or conveyer. Personnel may be stationed alongside the chute or conveyer to control the velocity of the packages to prevent any violent shock. Each chute must be wiped with machine oil before any package of explosives is transferred.

§ 176.167 Lights, tools, and equipment.

(a) No artificial light except electric lights or electric lamps or floodlights may be used on board a vessel during the loading or unloading of explosives.

(b) The carrier shall provide flashlights of a non-sparking type for persons required to enter holds in which explosives are stowed.

(c) No person on board a vessel loading, unloading or transporting explosives may carry firearms, matches, bale hooks, or metallic tools of other than the nonsparking type on board.

(d) No person engaged in loading or unloading Class A or Class B explosives may wear boots or shoes shod or strengthened with iron nails or other metal, unless the boots or shoes are covered with rubber, leather, felt or other non-sparking material.

§ 176.169 Fires.

(a) No fire is permitted on any dock, lighter, or vessel involved in the loading or unloading of explosives during the loading or unloading unless the fire is necessary.

(b) If a fire is necessary it must be properly safeguarded and under the direct observation of a competent person assigned for that purpose by the master of the vessel for the entire period of cargo transfer.

§ 176.171 Smoking.

(a) Smoking is prohibited on and near any vessel loading or unloading explosives at a waterfront facility. The Coast Guard officer having jurisdiction may designate smoking areas at a safe distance from the vessel. "NO SMOKING" signs must be posted during operations of handling, loading, or unloading the cargo. At least one "NO SMOKING" sign must be conspicuously posted on the pier at a reasonable distance from the vessel during the handling, loading or unloading of explosives.

(b) Smoking is prohibited on and near any vessel handling, loading or unloading explosives at an explosives anchorage. However, the Coast Guard officer having jurisdiction may, with the concurrence of the master or person in charge of the vessel, designate a compartment as a smoking area. "NO SMOKING" signs must be posted conspicuously outside the entrance to this compartment and in other parts of the vessel during the loading or unloading operations.

§ 176.173 Liquor or drugs.

A person who the master of a vessel finds, in his judgment, to be under the influence of liquor or drugs, may not be permitted on board during the loading, unloading, or transporting of explosives.

§ 176.177 Magazine vessels.

(a) *General.* The requirements of this section are applicable to magazine vessels and are in addition to any prescribed elsewhere in this subchapter.

(b) *Type vessel authorized.* A single deck vessel with or without a house on deck is the only type vessel that may be used as a magazine vessel. A magazine vessel may not be moved while explosives are on board.

(c) *Location of explosives.* Class A and Class B explosives, in excess of 5,000 pounds, stored in any magazine vessel must be stowed below deck. No explosive may be stowed on deck unless the vessel is fitted with a deck house having a stowage area which meets the requirements in this subpart for the stowage of explosives. Detonators, Class A explosives, and detonating primers, Class A explosives, may not be stored on the same magazine vessel with other Class A explosives or Class B explosives.

(d) *Explosives storage spaces.* Any compartment on a magazine vessel used for the stowage of explosives must be completely ceiled with wood so as to provide a smooth interior surface. Each metal stanchion in the compartment must be boxed in the same manner. An overhead ceiling is not required when the overdeck is weathertight. All nail and bolt heads must be countersunk and any exposed metal must be covered with wood.

(e) *Initiating explosives, detonators and detonating primers.* No initiating or priming explosive may be stowed in the same compartment with any other explosive when there is any high explosive on the same magazine vessel. Detonators and detonating primers must be stowed at least 25 feet from any bulkhead forming a boundary of a compartment containing any other explosives.

(f) *Dry storage spaces.* A magazine vessel having a dry storage space capable of being used for any purpose whatsoever must have a cofferdam at least 24 inches wide fitted between the dry storage space and each adjacent compartment containing explosives. The cofferdam must be constructed of wood or steel, formed by two tight athwartship bulkheads extending from the skin of the vessel to the overdeck. If the cofferdam extends to the weather deck, a watertight hatch must be fitted in the deck to provide access to the cofferdam.

(g) *Lighting.* Non-sparking, battery-powered, self-contained electric lanterns or non-sparking hand flashlights are the only means of artificial light authorized.

(h) *Living quarters.* Living quarters must be fitted on the inside with asbestos board or other equivalent fire resistant material. Bracketed ship's lamps are the only lighting fixtures authorized to be used in the living quarters. Any stove used for heating or cooking must be securely fastened and may not be mounted closer than 6 inches to the deck or sides of the house. Any smoke pipe for the stove which passes through the roof of the house must be kept at least 3 inches away from any woodwork. Each smoke pipe must be protected by a layer of asbestos, an air space of at least 1 inch, and a metal collar of at least 16 gauge sheet secured only on the weather side of the roof. There may be no opening from any living quarters into any stowage compartment.

(i) *Storage of other hazardous materials.* Magazine vessels having explosives on board may not be used for the storage of any other hazardous material.

(j) *Magazine vessel's stores.* Articles for use as stores on board any magazine vessel must be in compliance with the requirements of 46 CFR Part 147.

(k) *Matches.* Safety matches requiring a prepared surface for ignition are the only type of matches authorized for use on board a magazine vessel. They must be kept in a metal box or can with a metal cover and stored in the custodian's living quarters.

(l) *Firearms.* Firearms and ammunition (other than cargo) are not permitted on board a magazine vessel.

(m) *Fire extinguishing equipment.* No explosive may be received, stored, or dispensed from any magazine vessel, unless four 2½-gallon extinguishers of the soda-acid type and four 2-gallon pails filled with dry sand are placed about the vessel. The contents of each liquid extinguisher continuously exposed to a temperature lower than 40 degrees F. (45 degrees C.) must be modified or otherwise protected to prevent freezing.

(n) *Supervision.* A magazine vessel containing explosives must be continuously attended by a custodian employed for that purpose by the vessel's owner.

(o) *Unauthorized persons on magazine vessels.* The custodian of a magazine vessel shall prevent unauthorized persons from coming on board unless it is necessary to abate a hazard to human life or a substantial hazard to property.

(p) *Repacking of explosives on board.* No explosive may be repacked on board a magazine vessel. Any broken or damaged package must be placed in an open box and carried to a safe location for repacking or other disposition.

(q) *Work boat.* Each magazine vessel must be equipped with a work boat.

(r) *Life preservers.* One approved personal flotation device must be available for each person employed on a magazine vessel.

(s) *Fenders.* Each magazine vessel must be fitted with fenders in sufficient number and size to prevent any vessel tieing up alongside from coming in contact with the hull.

[Amdt. 176-1, 41 FR 16110, Apr. 15, 1976, as amended by Amdt. 176-10, 44 FR 70732, Dec. 10, 1979]

Subpart H—Detailed Requirements for Compressed Gases

§ 176.200 General stowage requirements.

(a) Each package of compressed gas being transported by vessel must be prevented from making direct contact with the vessel's deck, side or bulwark by dunnage, shoring, or other effective means.

(b) When cylinders of compressed gas being transported by vessel are stowed horizontal, each tier must be stowed in the cantilines of the lower tier and the valves on cylinders in adjacent tiers must be at alternate ends of the stow. Each tier may be stepped back and the ends alternated in order to clear the flange. Lashing must be provided to prevent any movement.

(c) When cylinders of compressed gas being transported by vessel are stowed in a vertical position they must be stowed upright in a block and cribbed or boxed in with suitable sound lumber. The box or crib must be dunnaged at least 4 inches off any metal deck. The cylinders in the box or crib must be braced to prevent any movement. The box or crib must be securely chocked and lashed to prevent any movement.

(d) A compressed gas packaging, bearing a Poison label, must be stowed away from all foodstuffs.

(e) Compressed gas may not be stowed "on deck" over a hold or compartment containing coal.

§ 176.205 Under deck stowage requirements.

(a) When compressed gas is stowed below deck, it must be stowed in a hold or compartment capable of being ventilated with no source of artificial heat and clear of crew and passenger living spaces. No bulkhead or deck of the hold or compartment may be a common boundary with any boiler room, engine room, coal bunker, galley or boiler room uptake.

(b) When flammable compressed gas is stowed below deck, it must be stowed in a hold or compartment which complies with paragraph (a) of this section and the following requirements:

(1) Each hold or compartment must be ventilated.

(2) Each hold or compartment must be equipped with an overhead water sprinkler system or fixed fire smothering system.

(3) Each electrical power line in the hold or compartment must be protected by a strong metal covering to prevent crushing by cargo being stowed against it.

(4) Except when fitted with electrical fixtures of the explosion-proof type, each electrical circuit serving the hold or compartment must be disconnected from all sources of power. No circuit may be energized until the flammable compressed gas cargo and any vapors have been removed from the hold or compartment. Portable lighting of the explosion-proof type may be used if the source of power is from electrical outlets outside the hold or compartment and above the weather deck.

(5) Any opening in a common bulkhead of an adjacent hold or compartment must be securely closed off and made gas tight, unless the adjacent hold or compartment is also used for the stowage of flammable compressed gas.

(6) Full and efficient hatch covers must be used. Tarpaulins, if fitted, must be protected by dunnaging before overstowing with any cargo. Each tarpaulin must be in one piece and free of rents, tears, and holes.

(7) A fire screen must be fitted at the weather end of each vent duct leading from the hold or compartment. The fire screen must completely cover the open area. It must consist of two layers of fine brass wire screen at least 20×20 mesh or finer, spaced not less than ⅛ inch or more than 1½ inches apart. The screen may be removable if means for securing it in place when in service are provided.

(8) The hold or compartment may not be fitted with any gooseneck type vent trunk head.

(9) All electrical apparatus located in the hold or compartment must have a positive means for disconnecting from power outside the hold or compartment containing any flammable compressed gas.

[Amdt. 176-1, 41 FR 16110, Apr. 15, 1976, as amended by Amdt. 176-1A, 41 FR 40690, Sept. 20, 1976]

§ 176.210 On deck stowage requirements.

Cylinders of compressed gas being transported by vessel must be protected from the direct rays of the sun by structural erections or awnings. A tarpaulin covering the cylinders is not acceptable if it comes in contact with them.

§ 176.220 Smoking or open flame and posting of warning signs.

(a) Smoking or the use of open flame is prohibited in any hold or compartment containing a flammable compressed gas, near any flammable compressed gas stowed on deck, or near any ventilator leading to a hold containing this material.

(b) A sign carrying the legend:

FLAMMABLE VAPORS
KEEP LIGHTS AND FIRE AWAY

NO SMOKING

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must be conspicuously posted at each approach to an "on deck" flammable compressed gas stowage area and near each cargo hold ventilator leading to a hold containing this material. The sign must be painted on a white background using red letters. The letters may not be less than 3 inches high.

§ 176.225 Stowage of chlorine.

Chlorine may not be stowed in the same hold or compartment with metallic sodium or potassium, phosphorus, copper or brass leaf sheets, powdered antimony, turpentine, ammonia, finely divided organic material, coal gas, hydrogen, or acetylene.

§ 176.230 Stowage of flammable compressed gases.

Flammable compressed gases transported in Specifications 106A and 110A multi-unit tank car tanks must be stowed on deck only, and must be shaded from radiant heat.

[Amdt. 176-4, 43 FR 8522, Mar. 2 1978]

Subpart I—Detailed Requirements for Flammable Liquids and Combustible Liquids

§ 176.305 General stowage requirements.

(a) Except as otherwise provided in § 176.76(g), a package containing a flammable liquid and equipped with a vent or safety relief device must be stowed "on deck" only.

(b) The following requirements apply to each hold or compartment in which a flammable or combustible liquid is being transported:

(1) The hold or compartment must be ventilated except that the stowage of packaged flammable liquids with a capacity of 110 gallons or less and with flash points above 73° F. may be in non-ventilated holds.

(2) Stowage of these liquids within 20 feet of a bulkhead which forms a boundary or deck of a boiler room, engine room, coal bunker, galley, or boiler room uptake is not permitted. If the amount of the liquid to be stowed in a hold will not permit compliance with the requirement for a 20-foot separation, less separation distance is authorized if at least one of the following conditions exists:

(i) The bulkhead or deck is covered with at least 3 inches of insulation on the entire area subject to heat;

(ii) A temporary wooden bulkhead at least 2 inches thick is constructed in the hold at least 3 inches off an engine room or 6 inches off a boiler room bulkhead, covering the entire area of the bulkhead that is subject to heat and the space between the permanent bulkhead and the temporary wooden bulkhead is filled with bulk asbestos or mineral wool; or

(iii) A temporary wooden bulkhead is constructed of at least one inch thick tongue and groove sheathing, located 3 feet from the boiler room or engine room bulkhead, and filled with sand to a height of 6 feet above the tank top, or, if the cargo compartment is located between decks, 3 feet of sand.

(3) Combustible liquids may be stowed in a hold within 20 feet of a common bulkhead with the engine room if the means of vessel propulsion is internal combustion engines; and

(4) Each cargo opening in a bulkhead of an adjacent hold must be securely closed off and made gas tight, unless the adjacent hold is also used for the stowage of a flammable or combustible liquid.

(c) In addition to the requirements specified in paragraph (b) of this section, the following requirements apply to each hold or compartment in which a flammable liquid is transported:

(1) Full and effective hatch covers must be used. Tarpaulins, if fitted, must be protected by dunnaging before overstowing with any cargo. Each tarpaulin must be in one piece and free of rents, tears, and holes;

(2) If flammable liquids in excess of one ton are stowed under deck in any one hold or compartment, a fire screen must be fitted at the weather end of each vent duct leading from that hold or compartment. The fire screen must completely cover the open area. It must consist of two layers of fine brass wire screen at least 20 × 20 mesh or finer spaced not less than ⅛ inch or more than 1½ inches apart. The screen may be removable if means for securing it in place when in service are provided;

(3) Each electrical power line in the hold or compartment must be protected by a strong metal covering to pre-

vent crushing by cargo being stowed against it;

(4) Except when fitted with electrical fixtures of the explosion-proof type, each electrical circuit serving the hold or compartment must be disconnected from all sources of power from a point outside the hold or compartment containing the flammable liquid. No circuit may be energized until the flammable liquids and any vapors have been removed from the hold or compartment. Portable lighting of the explosion-proof type may be used if the source of power is from electrical outlets outside the hold or compartment and above the weather deck;

(5) Flammable liquids in excess of one ton, except flammable liquids with a flashpoint above 73 °F., may not be transported in any hold or compartment that is fitted with a gooseneck type of vent head.

(d) On a passenger vessel, each hold or compartment used to transport flammable liquids must be equipped with an overhead water sprinkler system or fixed fire smothering system.

(e) On a passenger vessel, each hold or compartment used to transport a flammable liquid under a passenger space must have an overdeck of an A-60 type construction (see 46 CFR 72.05-10(c)(1)) or equivalent or have its underside covered with at least 3 inches of noncombustible insulation.

(f) No flammable liquid in a drum or wooden case, having inside packagings of more than one quart capacity each, may be stowed as a beam filler. A wooden barrel, a wooden box or a fiberboard box, with any flammable liquid in inside packagings of not more than one quart capacity each, may not be stowed as a beam filler unless it is possible to stow and observe any "THIS SIDE UP" marking.

[Amdt. 176-1, 41 FR 16110, Apr. 15, 1976, as amended by Amdt. 176-1A, 41 FR 40690, Sept. 20, 1976; Amdt. 176-21, 50 FR 11055, Mar. 19, 1985]

§ 176.315 Fire protection requirements.

(a) For each 21,000 U.S. gallons (or part thereof) of any flammable or combustible liquid being transported on board a vessel in a portable tank, tank car, or a tank truck, there must be provided at least one B-V semiportable foam (40 gallon capacity) (see 46 CFR 95.50), dry chemical (100 lbs. minimum capacity) or equivalent fire extinguisher, or a fire hose fitted with an approved portable mechanical foam nozzle with pick-up tube and two 5 gallon cans of foam liquid concentrate. Each foam system must be suitable for use with each flammable or combustible liquid it is intended to cover. Each fire extinguisher must be accessible to the tank it is intended to cover.

(b) The fire hose at each fire hydrant in the vicinity of flammable or combustible liquid stowage areas must be fitted with an approved combination spray nozzle.

(c) The pressure must be maintained in the vessel's fire mains during the loading and unloading of the flammable or combustible liquid.

(d) Two 15-pound capacity hand portable dry chemical or two portable 2½-gallon foam-type extinguishers must be accessible to any packaged flammable or combustible liquid and suitable for use with the lading.

(e) The requirements of this section do not apply to portable tanks and their contents authorized under 46 CFR 93.35 or 46 CFR Part 64.

[Amdt. 176-1, 41 FR 16110, Apr. 15, 1976, as amended by Amdt. 176-1A, 41 FR 40690, Sept. 20, 1976]

§ 176.320 Use of hand flashlights.

Each hand flashlight used in a hold or compartment containing any flammable liquid, or on deck near any flammable liquid, must be of the nonsparking type.

§ 176.325 Smoking or open flame and posting of warning signs.

(a) Smoking or the use of open flame is prohibited in any hold or compartment containing a flammable or combustible liquid, near any flammable or combustible liquid stowed on deck, or near any ventilator leading to a hold containing such material.

(b) A sign carrying the legend:

FLAMMABLE VAPORS
KEEP LIGHTS AND FIRE AWAY

NO SMOKING

must be conspicuously posted at each approach to a flammable or combustible liquid stowed "on deck" and near each cargo-hold ventilator leading to a hold or compartment containing this material. This sign must be painted on a white background using red letters. The letters may not be less than 3 inches high.

§ 176.331 Transportation of flammable liquids with foodstuffs.

Each package containing a flammable liquid which bears a Poison label must be stowed separate from foodstuffs.

§ 176.340 Combustible liquids in portable tanks.

(a) Combustible liquids may be transported by vessel in portable tanks only as specified below:

(1) Portable tanks authorized in § 173.119 of this subchapter.

(2) Portable tanks approved and maintained in accordance with 46 CFR 98.35, constructed prior to October 1, 1974. Such tanks may continue in service only until October 1, 1984.

(3) Portable tanks approved by the Commandant of the Coast Guard (G-MTH).

[Amdt. 176-14, 46 FR 58696, Dec. 3, 1981, as amended by Amdt. 176-21, 50 FR 11055, Mar. 19, 1985]

Subpart J—Detailed Requirements for Flammable Solids, Oxidizers, Organic Peroxides, and Blasting Agents

§ 176.400 Stowage of blasting agents, oxidizers and organic peroxides.

(a) No blasting agents, oxidizer or organic peroxide being transported by vessel may be stowed in the same hold or compartment with any readily combustible material such as a combustible liquid, a textile product, or with a finely divided substance such as an organic powder.

(b) No blasting agents, oxidizer or organic peroxide being transported by vessel may be stowed in a hold or compartment containing sulfur in bulk, or in any hold or compartment above, below, or adjacent to one containing sulfur in bulk.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 176-1, 41 FR 16110, Apr. 15, 1976, as amended by Amdt. 176-7, 44 FR 31185, May 31, 1979]

§ 176.405 Stowage of charcoal.

(a) Before stowing charcoal on a vessel for transportation, the hold or compartment in which it is to be stowed must be swept broom clean. All residue of former cargo, including a petroleum product, a vegetable or animal oil, nitrate, or sulfur, must be removed.

(b) Charcoal packed in bags and offered for transportation on board a vessel in a quantity over one ton must be loaded so that the bags are laid horizontally and stacked with space for efficient air circulation. If the bags are not compactly filled and closed to avoid free space within, vertical and horizontal dunnage strips must be laid between the bags. Space for ventilating must be maintained near bulkheads, the shell of the vessel, the deck and the overhead. No more than 40 tons of charcoal may be stowed in a hold or compartment when other stowage space is available. If the unavailability of hold or compartment space requires the stowage of a larger amount, the arrangement of the stow for ventilation must be adjusted to ensure a sufficient venting effect.

(c) Any loose material from bags broken during loading must be removed. Broken bags may be repacked or have the closures repaired and the repaired bags restowed.

(d) Charcoal "screenings" packed in bags must be stowed to provide spaces for air circulation between tiers regardless of the quantity stowed.

§ 176.410 Blasting agents, ammonium nitrate, and ammonium nitrate-mixtures.

(a) This section prescribes requirements to be observed with respect to transportation of each of the following hazardous materials by vessel:

(1) Blasting agents and ammonium nitrate-fuel oil mixtures.

(2) Ammonium nitrate (no organic coating).

(3) Ammonium nitrate (organic coating).

(4) Ammonium nitrate-carbonate mixture.

(5) Ammonium nitrate fertilizer (*containing no more than 0.2 percent carbon*).

(6) Ammonium nitrate mixed fertilizer.

(7) Ammonium nitrate phosphate.

(b) This section does not apply to any non-acidic ammonium nitrate mixed fertilizer containing 13 percent or less ammonium nitrate, less than 5 percent organic material, no other oxidizing material, and which does not meet the criteria for any other hazard class set forth in Part 173 of this subchapter.

(c) When blasting agents or any of the ammonium nitrates listed in paragraph (a) of this section is transported by vessel:

(1) It must be stowed well away from any steam pipe, electric circuit, or other source of heat;

(2) Smoking may not be permitted except in designated areas away from the material and "No-Smoking" signs must be posted in accordance with § 176.60;

(3) Fire hoses must be connected, laid out, and tested before loading or unloading commences; and

(4) A fire watch must be posted in the hold or compartment where the material is being loaded or unloaded.

(d) When blasting agents or any of the ammonium nitrates listed in paragraph (a) of this section are transported in bags by vessel:

(1) The requirements specified in paragraph (c) of this section must be complied with;

(2) The temperature of the bagged material may not exceed 130 degrees F.;

(3) Minimum dunnage and sweatboards must be used to prevent any friction or abrasion of bags, and to allow for the circulation of air and access of water in the event of fire;

(4) The bags must be stowed from side to side, out to the sweatboards;

(5) A space of 18 inches must be provided between any transverse bulkhead and the bags;

(6) The bags must be stowed so as to provide an 18-inch athwartship trench along the centerline of the compartment, continuous from bottom to top;

(7) The bags must be stowed so as to provide an 18-inch amidship trench running fore and aft from bulkhead to bulkhead;

(8) The bags may not be stowed closer than 18 inches from any overhead deck beam;

(9) The bags must be stowed so as to provide vent flues 14 inches square at each corner of the hatch continuous from top to bottom;

(10) Trenching must be accomplished by alternating the direction of the bags in each tier (bulkheading); and

(11) The bags must be blocked and braced as necessary to prevent shifting of the bagged cargo adjacent to any trench area.

(e) Blasting agents or any of the ammonium nitrates listed in paragraph (a) of this section may be transported by vessel with dynamite, commercial boosters, or other non-priming, non-initiating types of explosives which are compatible with dynamite:

(1) In the same hold or compartment with the explosives or in a hold or compartment adjacent to the explosives if the blasting agents or ammonium nitrate is packaged in strong metal cans, metal or fiber drums, barrels, kegs, or wooden or fiberboard boxes with noncombustible inside packagings; or

(2) In proximity to the explosives if the two are separated by a steel deck or bulkhead, or a fire retardant wooden bulkhead built to the specifications of § 176.138(b)(3). The deck or bulkhead must be sheathed on the oxidizing materials stowage side with one-inch asbestos board.

(f) An ammonium nitrate mixture containing any ingredient which would accelerate the decomposition of ammonium nitrate under conditions incident to transportation may not be transported by vessel.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 176-1, 41 FR 16110, Apr. 15, 1976, as amended by Amdt. 176-1A, 41 FR 40691, Sept. 20, 1976; Amdt. 176-7, 44 FR 31185, May 31, 1979]

§ 176.415 Permit requirements for blasting agents, ammonium nitrates, and certain ammonium nitrate mixtures.

(a) Except as provided in paragraph (b) of this section, before any of the following material is loaded on or unloaded from a vessel at any waterfront facility in the United States, its territories, or its possessions (except Panama Canal Zone), the carrier concerned must obtain written permission from the nearest District Commander, U.S. Coast Guard or Captain of the Port:

(1) Ammonium nitrate (organic coating).

(2) Ammonium nitrate mixtures containing more than 60 percent ammonium nitrate, ammonium nitrate-phosphate, or blasting agents or ammonium nitrate-fuel oil mixtures, packaged in a paper bag, burlap bag, or other nonrigid combustible packaging, or any rigid container with combustible inside packagings.

(3) Any other ammonium nitrate or ammonium nitrate mixture not listed in § 176.410(a) or (b).

(b) Any of the following may be loaded on or unloaded from a vessel at any waterfront facility without a permit:

(1) Ammonium nitrate (no organic coating) in a rigid container with non-combustible inside packaging.

(2) Ammonium nitrate fertilizer (containing no more than 0.2 percent carbon) if the nearest District Commander, U.S. Coast Guard or Captain of the Port is notified at least 24 hours in advance of any loading or unloading in excess of 1,000 pounds in any one vessel (See footnote 1 to § 173.182).

(3) Ammonium nitrate-phosphate in a rigid container with non-combustible inside packaging.

(4) Ammonium nitrate-carbonate mixture containing 40 percent or more fine calcium carbonate or dolomite.

(5) Non-acidic ammonium nitrate mixed fertilizer containing less than 5 per cent organic material and 60 per cent or less ammonium nitrate.

(6) Blasting agent, n.o.s. and ammonium nitrate-fuel oil mixtures in a rigid container with non-combustible inside packaging.

(c) Before a permit may be issued the following requirements must be met in addition to any others the District Commander or Captain of the Port may require:

(1) If the material is ammonium nitrate (organic coating), ammonium nitrate-phosphate, or blasting agents or ammonium nitrate-fuel oil mixtures in non-rigid combustible packaging or in a rigid container with combustible inside packaging, it must be loaded or unloaded at a facility remote from populous areas or high value or high hazard industrial facilities so that in the event of fire or explosion loss of lives and property may be minimized;

(2) If the material is ammonium nitrate (organic coated) in rigid metal drums with non-combustible inside packagings, an ammonium nitrate mixture containing more than 60 percent ammonium nitrate, or ammonium nitrate-phosphate, in rigid containers with combustible inside packagings, it must be loaded or unloaded at a facility removed from congested areas or high value or high hazard industrial facilities;

(3) Each facility at which the material is to be loaded or unloaded must conform with the requirements of the port security and local regulations and must have an abundance of water readily available for fire fighting; and

(4) Each facility at which the material is to be loaded or unloaded must be located so that each vessel to be loaded or unloaded has an unrestricted passage to open water. Each vessel must be moored bow to seaward, and must be maintained in a mobile status during loading, unloading, or handling operations by the presence of tugs or the readiness of engines. Each vessel must have two wire towing hawsers, each having an eye spice, lowered to the water's edge, one at the bow and the other at the stern.

(5) If the material is ammonium nitrate (organic coated), ammonium ni-

trate-phosphate, an ammonium nitrate mixture containing more than 60 percent ammonium nitrate, or blasting agents or ammonium nitrate-fuel oil mixtures in non-rigid combustible packaging and loaded in freight containers or roll-on, roll-off highway vehicles, it may be loaded or unloaded at a non-isolated facility provided that facility meets the approval of the Coast Guard Captain of the Port.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 176-1, 41 FR 16110, Apr. 15, 1976]

Editorial Note: For Federal Register citations affecting § 176.415 see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 176.419 Flammable solids or oxidizers transported with foodstuffs.

Each package containing a flammable solid or an oxidizer, bearing a Poison label and being transported on a vessel must be stowed separate from foodstuffs.

Subpart K—[Reserved]

Subpart L—Detailed Requirements for Poison A, Poison B, and Irritating Materials

§ 176.600 General stowage requirements.

(a) Each package bearing a Poison label and being transported on a vessel must be stowed well away from living quarters and any ventilation ducts serving living quarters and separate from foodstuffs.

(b) Each package bearing both a Poison Gas label and a Flammable Gas label must be segregated as a flammable compressed gas.

[Amdt. 176-1, 41 FR 16110, Apr. 15, 1976, as amended by Amdt. 176-1A, 41 FR 40691, Sept. 20, 1976]

§ 176.605 Care following leakage or sifting of poisons A or B.

A hold or compartment containing a package of Poison A or B which has leaked or sifted must be thoroughly cleaned and decontaminated after the cargo is unloaded and before the hold or compartment is used for the stowage of any other cargo.

Subpart M—Detailed Requirements for Radioactive Materials

Source: Amdt. 176-15, 48 FR 10245, Mar. 10, 1983, unless otherwise noted.

§ 176.700 General stowage requirements.

(a) Radioactive materials must not be stowed in the same hold with mail bags.

(b) A package of radioactive materials which in still air has a surface temperature more than 5° C (9° F) above the ambient air may not be overstowed with any other cargo. If the package is stowed under deck, the hold or compartment in which it is stowed must be ventilated.

(c) Each Fissile Class III shipment must be stowed in a separate hold, compartment, or defined deck area and be separated by a distance of at least six meters (20 feet) from all other Radioactive Category II- or III-Yellow labeled packages.

(d) For a shipment of radioactive materials requiring supplemental operational procedures, the shipper must furnish the master or person in charge of the vessel a copy of the necessary operational instructions.

(e) A person may not remain unnecessarily in a hold, or compartment, or in the immediate vicinity of any package on deck, containing radioactive materials.

(The information collection requirements in paragraph (d) were approved by the Office of Management and Budget under control numbers 2137-0534, 2137-0535 and 2137-0536)

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 176-15, 48 FR 10245, Mar. 10, 1983, as amended by Amdt. 176-15, 48 FR 31220, July 7, 1983; Amdt. 176-23, 50 FR 41523, Oct. 11, 1985]

§ 176.704 Requirements relating to transport indexes.

(a) The sum of the transport indexes for all packages of radioactive materials not in freight container on board a vessel, may not exceed 200.

(b) Except as provided in paragraph (e) of this section, the sum of transport indexes for packages not in a freight container may not exceed 50 in any hold, compartment, or defined deck area. Each group of radioactive material packages must be separated by a distance of at least six meters (20 feet) at all times.

(c) Except as provided in paragraph (e) of this section, the number of freight containers with packages of radioactive materials contained therein must be limited so that the total sum of the transport indexes in the containers in any hold or defined deck area does not exceed 200, and:

(1) The sum of transport indexes for any individual freight container, or group of freight containers, does not exceed 50; and

(2) Each freight container or group of freight containers is handled and stowed in such a manner that groups are separated from each other by a distance of at least six meters (20 feet).

(d) The limitations specified in paragraphs (a), (b), and (c) of this section do not apply to consignments of low specific activity materials if the packages are marked "RADIOACTIVE LSA" and no Fissile Class II or Fissile Class III radioactive materials are included in the shipment.

(e) For exclusive use shipments, the limitations specified in paragraphs (b) and (c) of this section do not apply if:

(1) For packages not in freight containers, the sum of the transport indexes of Fissile Class II packages does not exceed 50 in each hold;

(2) For packages in freight containers, the radiation level does not exceed 200 millirem per hour at any point on the surface and 10 millirem at two meters (6 feet) from the outside surface of the freight container and the sum of transport indexes of Fissile Class II packages does not exceed 50 in each freight container and 200 in each hold or defined deck area; and

(3) Each group of Fissile Class II packages is separated from other redioactive material by a distance of at least six meters (20 feet) at all times.

(f) The limitations specified in paragraphs (a) through (e) of this section do not apply when the entire vessel is reserved or chartered for use by a single shipper under exclusive use conditions if the number of Fissile Class II and Fissile Class III packages of radioactive materials aboard the vesssel does not exceed the amount authorized in §§ 173.451 through 173.459 of this subchapter. The entire shipment operation must be approved by the Office of Hazardous Materials Transportation (OHMT) in advance.

§ 176.708 Segregation distance table.

(a) Table III applies to the stowage of packages of radioactive materials on board a vessel with regard to transport index numbers which are shown on the labels of individual packages. Radioactive Category II or III-Yellow labeled packages may not be stowed any closer to living accommodations, regularly occupied working spaces, spaces that may be continually occupied by any person (except those spaces exclusively reserved for couriers specifically authorized to accompany such packages), and undeveloped film than the distance specified to Table III. Where only one consignment of a radioactive substance is to be loaded on board a vessel under exclusive use conditions, the appropriate segregation distance may be established by demonstrating that the direct measurement of the radiation level at regularly occupied working spaces and living quarters is less than 0.75 millirem per hour. More than one consignment may be loaded onboard a vessel with the appropriate segregation distance established by demonstrating that direct measurement of the radiation level at regularly occupied working spaces and living quarters is less than 0.75 millirem per hour, provided that the vessel has been chartered for the exclusive use of a competent person specialized in the carriage of radioactive material. Stowage arrangements shall be predetermined for the entire voyage, including any radioactive substances to be loaded at ports of call enroute. The radiation level shall be measured by a responsible person skilled in the use of monitoring instruments.

TABLE III

Sum of transport indexes of the packages	Minimum distance in feet from living accommodation or regularly occupied working space		Minimum distance in feet from undeveloped film and plates																							
			1 day voyage			2 day voyage			4 day voyage			10 day voyage			20 day voyage			30 day voyage			40 day voyage			50 day voyage		
	Cargo thickness in feet (unit density)																									
	Nil	3	Nil	3	6	Nil	3	6	Nil	3	6	Nil	3	6	Nil	3	6	Nil	3	6	Nil	3	6	Nil	3	6
0.1 to 0.5	5	X	6	X	X	8	X	X	11	X	X	17	4	X	25	6	X	30	7	X	35	8	X	39	9	X
0.6 to 1	6	X	8	X	X	11	X	X	16	4	X	25	6	X	35	8	X	42	10	X	50	12	X	55	13	X
1.1 to 2	9	X	11	X	X	16	4	X	22	5	X	35	8	X	50	12	X	61	14	X	70	17	X	78	19	X
2.1 to 3	10	X	14	X	X	19	5	X	27	6	X	42	10	X	61	14	X	74	18	X	86	20	X	96	23	X
3.1 to 5	13	X	17	4	X	25	6	X	35	8	X	55	13	X	78	19	X	96	23	X	110	26	X	124	29	7
5.1 to 10	19	4	25	6	X	35	8	X	50	12	X	78	19	X	110	26	X	135	33	8	155	37	9	175	42	10
10.1 to 20	26	6	35	8	X	50	12	X	69	17	X	110	26	X	155	37	9	190	46	11	220	53	13	250	59	14
20.1 to 30	32	8	43	10	X	61	14	X	85	20	X	135	32	8	190	45	11	235	56	13	270	65	16	305	72	17
30.1 to 50	42	10	55	13	X	78	19	X	110	26	X	175	42	10	245	58	14	300	73	17	350	84	20	390	94	22
50.1 to 100	59	14	78	19	X	110	26	X	155	37	9	245	59	14	350	82	20	430	105	24	515	118	28	550	130	32
100.1 to 150	72	17	96	23	X	135	32	8	190	46	11	300	72	17	425	100	24	525	125	30	600	145	35	(7)	165	39
150.1 to 200	84	20	110	26	X	155	37	9	200	53	13	350	84	20	490	115	28	600	140	35	(7)	165	40	(7)	190	45
200.1 to 300	105	24	135	32	X	190	46	11	270	64	15	425	105	25	600	145	35	(7)	180	42	(7)	205	49	(7)	230	55
300.1 to 400	120	28	160	37	9	220	53	13	310	75	18	500	120	28	(7)	165	40	(7)	205	49	(7)	235	57	(7)	265	63

Note:

(1) X—indicates that thickness of screening cargo is sufficient without any additional segregation distance.

(2) By using 6 feet of intervening unit density cargo for persons and 10 feet for film and plates, no distance shielding is necessary for any length of voyage specified.

(3) Using 1 steel bulkhead or steel deck—multiply segregation distance by 0.8. Using 2 steel bulkheads or steel decks—multiply segregation distance by 0.64.

(4) "Cargo of Unit Density" means cargo stowed at a density of 1 ton (long) per 36 cubic feet; where the density is less than this the depth of cargo specified must be increased in proportion.

(5) "Minimum distance" means the least in any direction whether vertical or horizontal from the outer surface of the nearest package.

(6) The total consignment on board at any time must not exceed transport indexes totalling 200 except if carried under the provisions of § 176.704(f). The figures below the double line of the table should be used in such a contingency.

(7) Not to be carried unless screening by other cargo and bulkheads can be arranged in accordance with the other columns.

TABLE III—Continued

Sum of transport indexes of the packages	Minimum distance in meters from living accommodation or regularly occupied working space		Minimum distance in meters from undeveloped film and plates																							
			1 day voyage			2 day voyage			4 day voyage			10 day voyage			20 day voyage			30 day voyage			40 day voyage			50 day voyage		
	Cargo thickness in meters (unit density)																									
	Nil	1	Nil	1	2	Nil	1	2	Nil	1	2	Nil	1	2	Nil	1	2	Nil	1	2	Nil	1	2	Nil	1	2
0.1 to 0.5	2	X	2	X	X	3	X	X	4	X	X	6	2	X	8	2	X	10	3	X	11	3	X	12	3	X
0.5 to 1.0	2	X	3	X	X	4	X	X	5	2	X	8	2	X	11	3	X	13	4	X	15	4	X	17	4	X
1.1 to 2.0	3	X	4	X	X	5	2	X	7	2	X	11	3	X	15	4	X	19	5	X	22	5	X	24	6	X
2.1 to 3.0	4	X	5	X	X	6	2	X	9	2	X	13	4	X	19	5	X	23	6	X	27	7	X	30	7	X
3.1 to 5.0	4	X	6	2	X	8	2	X	11	3	X	17	4	X	24	6	X	30	7	X	34	8	X	38	9	3
5.1 to 10.0	6	2	8	2	X	11	3	X	15	4	X	24	6	X	34	8	X	42	10	3	48	12	3	54	13	3
10.1 to 20.0	8	2	11	3	X	15	4	X	22	5	X	34	8	X	48	12	3	59	14	4	68	16	4	76	18	5
20.1 to 30.0	10	3	13	4	X	19	5	X	26	7	X	42	10	3	59	14	4	72	17	4	83	20	5	93	22	6
30.1 to 50.0	13	3	17	4	X	24	6	X	34	8	X	54	13	3	76	18	5	92	23	6	110	26	7	120	29	7
50.1 to 100.0	18	5	24	6	X	34	8	X	48	12	3	76	18	5	110	25	6	130	32	8	150	36	9	170	40	10
100.1 to 150.0	22	6	30	7	X	42	10	3	59	14	4	93	22	6	130	31	8	160	39	10	185	45	11	(7)	50	12
150.1 to 200.0	26	6	34	8	X	48	12	3	68	16	4	110	26	7	150	36	9	185	43	11	(7)	51	13	(7)	58	14
200.1 to 300.0	32	8	42	10	3	59	14	4	83	20	5	130	32	8	185	44	11	(7)	55	13	(7)	63	15	(7)	70	17
300.1 to 400.0	36	9	48	12	3	68	16	4	95	23	6	150	36	9	(7)	50	13	(7)	63	15	(7)	73	18	(7)	81	20

Note:

(1) X—indicates that thickness of screening cargo is sufficient without any additional segregation distance.

(2) By using 2 meters of intervening unit density cargo for persons and 3 meters for film and plates, no distance shielding is necessary for any length of voyage specified.

(3) Using 1 steel bulkhead or steel deck—multiply segregation distance by 0.8. using 2 steel bulkheads or steel decks—multiply segregation distance by 0.64.

(4) "Cargo of Unit Density" means cargo stowed at a density of 1 ton (metric) per cubic meter; where the density is less than this the depth cargo specified must be increased in proportion.

(5) "Minimum distance" means the least in any direction whether vertical or horizontal from the outer surface of the nearest package.

(6) The total consignment on board at any time must not exceed transport indexes totalling 200, unless carried under the provisions of § 176.704(f). The figures below the double line of the table should be used in such a contingency.

(7) Not to be carried unless screening by other cargo and bulkheads can be arranged in accordance with the other columns.

§ 176.710 Care following leakage or sifting of radioactive materials.

(a) In case of fire, collision, or breakage involving any shipment of radioactive materials, other than materials of low specific activity, the radioactive materials must be segregated from unnecessary contact with personnel. In case of obvious leakage, or if the inside container appears to be damaged, the stowage area (hold, compartment, or deck area) containing this cargo must be isolated as much as possible to prevent radioactive material from entering any person's body through contact, inhalation, or ingestion. No person may handle the material or remain in the vicinity unless supervised by a qualified person.

(b) A hold or compartment in which leakage of radioactive materials has occurred may not be used for other cargo until it is decontaminated in accordance with the requirements of § 176.715.

(c) For reporting requirements, see § 171.15 of this subchapter.

§ 176.715 Contamination control.

(a) Each hold, compartment, or deck area used for the transportation of low specific activity radioactive materials under exclusive use conditions shall be surveyed with appropriate radiation detection instruments after each use. Such holds, compartments, and deck areas may not be used again until the radiation dose rate at any accessible surface is less than 0.5 millirem per hour, and the removable (non-fixed) radioactive surface contamination is not greater than the limits prescribed in § 173.443 of this subchapter.

Subpart N—Detailed Requirements for Corrosive Materials

§ 176.800 General stowage requirements.

(a) Each package of a corrosive material being transported on a vessel must be stowed well away from living quarters, foodstuffs, and cargo of an organic nature.

(b) Each package of a corrosive material must be stowed so as to be readily observable except when stowed in a freight container, or a barge, carried aboard a vessel, that is readily observable.

(c) A package of corrosive material may not be stowed over any combustible substance.

(d) Glass carboys containing corrosive material may not be stowed on board any vessel, other than a barge, more than two tiers high unless each carboy is boxed or crated with neck protection extending to the sides of the carboy box. This protective construction must be strong enough to permit stacking one on top of the other.

(e) A corrosive material may not be stowed over a hold or compartment containing cotton unless the deck is of steel and the hatch is fitted with a tight coaming. In addition, the deck must be tight against leakage and the corrosive material may not be stowed over the square of the hatch.

[Amdt. 176-1, 41 FR 16110, Apr. 15, 1976, as amended by Amdt. 176-1A, 41 FR 40691, Sept. 20, 1976]

§ 176.805 On deck stowage.

(a) When break bulk corrosive materials being transported on a vessel are stowed on deck:

(1) Provisions must be made for leakage from any package to drain away from other cargo into an overboard scupper or freeing port. The drainage may not enter an enclosed drainage system other than a direct overboard scupper. If the stowage is not practical, sufficient clean dry sand must be placed under and around the lower tier of packages to absorb any leakage.

(2) Dunnage must be provided on the deck and arranged so that any leakage will be apparent.

(3) Any leakage that occurs must be washed down, using liberal quantities of water.

[Amdt. 176-1, 41 FR 16110, Apr. 15, 1976, as amended by Amdt. 176-1A, 41 FR 40691, Sept. 20, 1976]

Subpart O—Detailed Requirements for Other Regulated Materials (ORM)

§ 176.900 Stowage of cotton and fibers generally.

(a) Cotton or fibers being transported on a vessel must be securely baled and bound. Each cotton or fiber bale must be covered with bagging on at least three-fourths of its surface, including both ends. Cut cotton linters may be accepted for transportation by vessel when baled and covered with bagging on the soft sides only if the bale is compressed to a density of at least 32 pounds per cubic foot and it is bound with at least six bands per bale. Any poorly compressed bale or any bale having damaged bindings may not be transported by vessel.

(b) Each wet bale must be stowed separately from any dry bales, preferably in a 'tween deck space and not overstowed. Any bale which is saturated with water may not be transported by vessel.

(c) Bales showing contact with oil or grease may not be accepted for transportation by vessel.

(d) Cotton or fibers must be stowed in a hold or compartment in accordance with the following requirements:

(1) All traces of oil or residue in the hold or compartment must be removed;

(2) A recently painted hold or compartment may not be used unless it is thoroughly dry;

(3) Each ventilation cowl serving the hold or compartment must be fitted with a spark screen;

(4) When a bulkhead of the hold or compartment is common with a boiler room, engine room, coal bunker, or galley and subjected to heat, a wooden bulkhead must be erected between the bulkhead and any cotton or fibers. This wooden bulkhead must be at least 6 inches from a boiler room bulkhead, and at least 2 inches from an engine room, coal bunker or galley bulkhead;

(5) Each 'tween deck hatch must be closed with hatch covers, tarpaulins, and dunnage; however, metal hatch covers which are sealed by other means to provide equivalent protection may be used;

(6) Each hold or compartment must be equipped with a carbon dioxide, steam smothering, or overhead water sprinkler system or other approved fixed smothering system. Before loading, the extinguishing system must be examined to ensure that it is in good working condition; and

(7) Each hold or compartment must be clear of all debris and swept broom clean before loading.

(e) Naked lights or any fire likely to produce sparks are not permitted on the vessel, dock area, or any lighters alongside during loading or unloading of cotton or fibers.

(f) Upon completion of stowage, each hatch opening must be completely closed. Where required, tarpaulins must be fitted and secured in place to provide a tight hold. During a period of temporary stoppage of loading or unloading, a hatch may be left open. However, a fire watch, designated by the master or officer-in-charge, must be stationed in the hold or compartment in which the cotton or fibers are stowed.

(g) At least one fire hose must be connected while cotton or fibers are being loaded or unloaded. Each fire pump must be operated before any loading or unloading. Pressure must be maintained on each fire main during the loading and the fire hose laid out ready for immediate use. Portable fire extinguishers must be placed to be readily available. The fire hose, fire pumps and fire extinguishers may be the vessel's equipment or shore equipment.

(h) Smoking is not permitted on a vessel during the loading or unloading of cotton or fibers except at those times and in those places designated by the master or officer-in-charge. "NO SMOKING" signs must be conspicuously posted in appropriate places and the officer in charge of the loading or unloading must see that they are observed.

(i) All cotton or fibers must be segregated in accordance with the requirements applicable to flammable solids (see § 176.83(b)) but may not be stowed in the same hold with other Flammable solids.

(j) Cotton or fibers may be stowed in the same hold over bulk sulfur if the sulfur has been trimmed and leveled and the hold is thoroughly cleaned of sulfur dust. A tight floor of two 1-inch crossed clean dunnage boards must be laid on the sulfur before cotton or fibers are stowed. These substances may be stowed alongside each other in the same hold if they are separated by a tight dustproof wood bulkhead.

(k) Cotton or fibers may not be stowed in a 'tween deck hold over bulk sulfur in a lower hold unless the 'tween deck hold has been thoroughly cleaned of all sulfur dust and the 'tween deck hatch covers are in place and covered with tarpaulins and dunnage.

(l) Cotton or fibers may not be stowed in the same hold with any combustible liquid. Cotton or fibers may be stowed in a hold adjacent to any hold above, or any hold below one containing these materials if the holds are separated by a tight steel bulkhead or deck.

[Amdt. 176-1, 41 FR 16110, Apr. 15, 1976, as amended by Amdt. 176-1A, 41 FR 40691, Sept. 20, 1976]

§ 176.901 Stowage of cotton or fibers with rosin or pitch.

Cotton or fibers being transported on a vessel may not be stowed in the same hold or compartment with rosin or pitch being transported on the same vessel. When separate stowage is not practicable, the cotton or fibers may be stowed in the same hold or compartment with rosin or pitch if they are separated by clean dunnage or a cargo of a non-combustible nature. When stowage within the same hold or compartment involves large amounts of cotton or fibers and rosin or pitch, the rosin or pitch must be floored off with at least two layers of 1-inch dunnaging and the cotton or fibers stowed above.

§ 176.902 Stowage of cotton or fibers with vegetable, animal, or rosin oil.

(a) When practicable, fish oil, whale oil, vegetable oil, animal oil, or rosin oil being transported on a vessel may not be stowed in the same hold or compartment with any cotton or fibers being transported on the same vessel. When separate stowage is not practicable, the cotton and fibers must be stowed so that there is no contact with any of those oils. If cotton or other fibers are transported over any of those oils, a tight 2-inch floor of dunnage boards must be laid over the oils before the cotton or fibers are placed on top.

(b) Cotton or fibers may not be stowed in a hold below one in which any of those oils are stowed unless the 'tween deck hatch is fitted with a tight coaming and the deck is of steel and made tight against leakage.

§ 176.903 Stowage of cotton fibers with coal.

Cotton or fibers being transported on a vessel may not be stowed in the same hold with coal. They may be stowed in adjacent holds if the holds are separated by a tight steel bulkhead and the cotton or fibers are dunnaged at least 2 inches off the bulkhead. Cotton or fibers may be stowed in a hold above or below one in which coal is stowed if there is a tight steel intervening deck and all hatch covers are in place and covered with tarpaulins.

§ 176.904 Cotton or fibers with synthetic nitrate of soda.

Cotton or fibers being transported on a vessel may not be stowed in the same hold with synthetic nitrate of soda. They may be stowed in adjacent holds if the holds are separated by a tight steel bulkhead. Cotton or fibers may be stowed in a hold above or below one in which synthetic nitrate of soda is stowed if there is a tight steel intervening deck and all hatch covers are in place and covered with tarpaulins.

§ 176.905 Motor vehicles or mechanical equipment powered by internal combustion engines.

(a) A motor vehicle or any mechanized equipment powered by an internal combustion engine is subject to the requirements of this subchapter when carried as cargo on a vessel if the engine or fuel tank contains fuel or if either battery cable is connected. Such vehicles or equipment are excepted from the requirements of this subchapter if the following requirements are met:

(1) For a motor vehicle or mechanical equipment having an internal combustion engine employing fuel classed as flammable by this subchapter, the fuel tank is empty, the engine is run until it stalls for lack of fuel, both battery cables are disconnected, and no hazardous material is stowed in the vehicle or equipment, or

(2) For motor vehicle or mechanical equipment having an internal combustion engine employing liquid fuel classed as combustible by this subchapter, the fuel tank contains 110 gallons of fuel or less, both battery cables are disconnected and no hazardous material is stowed in the vehicle or equipment.

(b) Before being loaded on a vessel, each vehicle must be inspected for leaks. A vehicle showing any signs of leakage may not be transported.

(c) Each vehicle stowed in a hold or compartment must have the battery cables disconnected and secured away from the battery terminals, unless it is stowed in a hold or compartment designated by the administration of the country in which the vessel is registered to be specially suited for vehicles. See 46 CFR 70.10-44 and 90.10-38 for U.S. vessels.

(d) The fuel tank of a vehicle being transported as cargo on a vessel may not be more than one-fourth full.

(e) All equipment used for handling vehicles must be designed so that the fuel tank and fuel system are protected from stress that might cause rupture or other damage incident to handling.

(f) Whenever possible each vehicle must be stowed to allow for its inspection during transit.

(g) Two hand-held, portable, dry chemical fire extinguishers of at least 10 pounds capacity each must be separately located in an accessible location in each hold or compartment in which any motor vehicle is stowed.

(h) "NO SMOKING" signs must be conspicuously posted at each access opening to the hold or compartment.

(i) Except when being transported in a space specially suited for vehicles, the following additional requirements apply to the stowage of any vehicles containing a flammable liquid:

(1) Each portable electrical light and hand flashlight used in the stowage area must be an approved, explosion-proof type. All electrical connections for any portable light must be made to outlets outside the space in which any vehicle is stowed;

(2) Each hold or compartment must be ventilated and fitted with an overhead water sprinkler system or fixed fire extinguishing system;

(3) Each hold or compartment must be equipped with a smoke or fire detection system; and

(4) All electrical equipment in the hold or compartment other than fixed explosion-proof lighting must be disconnected from its power source at a location outside the hold or compartment during the handling and transportation of any vehicle. Where the disconnecting means is a switch or circuit breaker, it must be locked in the open position until all vehicles have been discharged.

(j) Motor vehicles may be refueled when necessary in the hold of a vessel in accordance with § 176.78.

(k) Motor vehicles with fuel in their tanks may be stowed in a closed freight container if the following warning is affixed to the access doors: "WARNING—MAY CONTAIN EXPLOSIVE MIXTURES WITH AIR—KEEP IGNITION SOURCES AWAY WHEN OPENING." The warning must be on a contrasting background and must be readily legible from a distance of 25 feet.

(l) No hazardous materials other than motor vehicles or mechanized equipment and their equipment may be stowed in the same hold or compartment with any vehicle having a flammable liquid or flammable compressed gas in its tank.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 176-1, 41 FR 16110, Apr. 15, 1976. Redesignated and amended by Amdt. 176-1A, 41 FR 40690, Sept. 20, 1976]

Editorial Note: For Federal Register citations affecting § 176.905, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 176.906 Stowage and handling of asbestos.

Asbestos must be stowed, handled, and unloaded, and any asbestos contamination of vessels removed, in a manner that will minimize occupational exposure to airborne asbestos particles released incident to transportation. (See § 173.1090 of this subchapter.)

[Amdt. 176-6, 43 FR 56668, Dec. 4, 1978]

PART 177—CARRIAGE BY PUBLIC HIGHWAY

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Subpart E—Regulations Applying to Hazardous Material on Motor Vehicles Carrying Passengers for Hire

177.870 Regulations for passenger carrying vehicles.

APPENDIX A—RELATIONSHIP BETWEEN ROUTING REQUIREMENTS IN PART 177 WITH STATE AND LOCAL REQUIREMENTS

AUTHORITY: 49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53(e).

EDITORIAL NOTE: Nomenclature changes affecting Part 177 appear at 50 FR 45732, Nov. 1, 1985.

Subpart A—General Information and Regulations

§ 177.800 Purpose of regulations in Parts 170–189 of this chapter.

(a) To promote the uniform enforcement of law and to minimize the dangers to life and property incident to the transportation of hazardous materials, by private, common and contract carriers, by motor vehicle engaged in interstate or foreign commerce, the regulations in Parts 170-189 of this subchapter are prescribed to define these articles for motor vehicle transportation purposes, and to state the precautions that must be observed by the carrier in handling them while in transit. It is the duty of each such carrier to make the prescribed regulations effective and to thoroughly instruct employees in relation thereto.

[29 FR 18795, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 177.800, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 177.801 Scope of regulations in Parts 170–189 of this chapter.

(a) Hazardous materials except such as may not be accepted and transported under Parts 170-189 of this subchapter, may be accepted and transported by private, common and contract carriers by motor vehicle engaged in interstate or foreign commerce, provided they are in proper condition for transportation and are certified as being in compliance with Parts 170-189 of this subchapter, and provided the method of manufacture, packing, and storage, so far as they affect safety in transportation, are open to inspection by a duly authorized representative of the initial carrier or of the Bureau of Explosives. Shipments of explosives or other dangerous articles not in proper condition for transportation, or loaded or stayed as required, or certified as to proper packing, marking and description as required in Parts 170-189 of this subchapter, must not be accepted for transportation or transported.

[29 FR 18795, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 177.801, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 177.802 Application of regulations in Parts 170–189 of this chapter.

(a) Parts 170-189 of this subchapter apply to all private, common and contract carriers by motor vehicle transporting hazardous materials as defined by Department of Transportation "Regulations for Transportation of Hazardous Materials by Land and Water in Rail Freight, Express and Baggage Services and by Motor Vehicle (Highway) and Water". When shipments are accepted by motor vehicle for further transportation by rail express (see also paragraph (c) of this section), rail baggage (see also paragraph (d) of this section), rail freight or by water on board vessel, they must, in addition to Parts 170-189 of this subchapter, comply with the applicable regulations for the service by which they are to be transported.

[29 FR 18795, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 177-24, 38 FR 5314, Feb. 27, 1973; Amdt. 177-35, 41 FR 16130, Apr. 15, 1976]

§ 177.803 Export and import shipments by domestic carriers by motor vehicles.

See § 171.12 of this subchapter.

[Amdt. 177-35, 41 FR 16130, Apr. 15, 1976]

§ 177.804 Compliance with Federal Motor Carrier Safety Regulations.

Motor carriers and other persons subject to this part shall comply with 49 CFR Parts 390 through 397 (excluding §§ 397.3 and 397.9) to the extent those rules apply.

[Amdt. 177-39, 43 FR 4859, Feb. 6, 1978]

§ 177.805 Canadian shipments and packagings.

(a) Canadian shipments and packagings may be carried under conditions specified in § 171.12a of this subchapter.

[Amdt. 177-7, 34 FR 17524, Oct. 30, 1969, as amended by Amdt. 177-35, 41 FR 16130, Apr. 15, 1976; Amdt. 177-67, 50 FR 41521, Oct. 11, 1985]

§ 177.806 U.S. Government material.

(a) Shipments of hazardous materials offered by or consigned to the Department of Defense (DOD) of the U.S. Government must be packaged, including limitations of weight, in accordance with the regulations in this subchapter or in containers of equal or greater strength and efficiency as required by DOD regulations.

(1) Hazardous materials sold by the DOD in packagings that are not marked in accordance with the requirements of this subchapter may be

shipped from DOD installations if the DOD certifies in writing that the packagings are equal to or greater in strength and efficiency than the packaging prescribed in this subchapter. The shipper shall obtain such a certification in duplicate for each shipment. He shall give one copy to the originating carrier and retain the other for no less than 1 year.

(b) Shipments of radioactive materials, made by or under the direction or supervision of the U.S. Department of Energy or the Department of Defense, and which are escorted by personnel specially designated by or under the authority of those agencies, for the purpose of national security, are exempt from the regulations in Parts 170-189 of this subchapter.

[29 FR 18795, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 177.806, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 177.807 Reporting hazardous materials incidents.

When an incident occurs during transporation in which a hazardous material is involved, a report may be required (see §§ 171.15, 171.16, and 171.17 of this subchapter).

[Amdt. 177-48, 45 FR 34705, May 22, 1980]

§ 177.808 Connecting carrier shipments.

Shipments of hazardous materials offered by connecting transportation lines must comply with Parts 170-189 of this subchapter.

[29 FR 18795, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 177-35, 41 FR 16130, Apr. 15, 1976]

§ 177.809 Carrier's material and supplies.

The regulations in Parts 170-189 of this subchapter apply to all shipments of hazardous materials, including carrier's material and supplies.

[29 FR 18795, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 177-35, 41 FR 16130, Apr. 15, 1976]

§ 177.810 Vehicular tunnels.

Except as regards radioactive materials, nothing contained in Parts 170-189 of this subchapter shall be so construed as to nullify or supersede regulations established and published under authority of State statute or municipal ordinance regarding the kind, character, or quantity of any hazardous material permitted by such regulations to be transported through any urban vehicular tunnel used for mass transportation. For radioactive materials, see § 177.825 of this part.

[Amdt. 177-52, 46 FR 5316, Jan. 19, 1981]

§ 177.811 Astray shipments.

(a) Any carrier in possession of an astray shipment of hazardous materials (other than explosives) shall forward it promptly to its destination, if known, after inspection has shown the package to be in proper condition for transportation.

(b) If the package of hazardous materials is not labeled and the exact classification of the contents is not determinable, the carrier shall apply a FLAMMABLE LIQUID label.

[Amdt. 177-35, 41 FR 16130, Apr. 15, 1976, as amended by Amdt. 177-35A, 41 FR 40691 Sept. 20, 1976]

§ 177.812 Containers required.

Containers required for hazardous materials are prescribed in Part 173 of this subchapter.

[29 FR 18795, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 177-35, 41 FR 16130, Apr. 15, 1976]

§ 177.813 Inefficient containers.

The results of experience gained by examination of broken or leaking containers must be recorded by the Bureau of Explosives to the end that further use of any particular kind of container shown by experience to be inefficient, may be prohibited by the Department.

[29 FR 18795, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

§ 177.814 Retention of manufacturer's certificate and retest reports.

(a) Each motor carrier who uses a cargo tank vehicle shall have in his files a certificate or manufacturer's data report signed by a responsible official of the manufacturer or fabricator of the cargo tank, or a competent testing agency, certifying that the cargo tank identified in the certificate was manufactured and tested in accordance with the requirements contained in the specification under which the cargo tank was constructed. The certificate and any other data furnished as required by the specification must be retained at the principal office of the carrier during the time that the cargo tank is used by the carrier and for one year thereafter.

(1) Except for specifications MC 330 and MC 331 cargo tanks, a motor carrier may himself perform the tests and inspections to determine whether the tank meets the requirements of the specification. If the motor carrier performs the tests and inspections and determines that the tank conforms to the specification, he may use the tank if he retains the test data, in place of a certificate, in his files at his principal office for as long as he uses the tank and one year thereafter.

(2) A motor carrier using a specification MC 330 cargo tank for which such carrier is unable to obtain the manufacturer's data report required by the specification may copy the information contained on the cargo tank's identification plate and ASME Code plate and retain such information as required by this section.

(3) Each motor carrier who uses a specification cargo tank which he does not own and has not tested or inspected shall obtain a copy of the manufacturer's certificate or manufacturer's data report and retain it in his files at his principal office during the time he uses the tank and for one year thereafter. A motor carrier using a specification MC 330 cargo tank which he does not own may copy the information contained on the cargo tank's identification plate and ASME Code plate if the manufacturer's data report is not available from the owner of the tank.

(b) Upon a written request to, and with the approval of, the Director, Regional Motor Carrier Safety Office, for the region in which a motor carrier has his principal place of business, a motor carrier may retain the certificate and other data specified in paragraph (a) of this section at a regional or terminal office. The address and jurisdictions of the Directors of Regional Motor Carrier Safety Offices are shown in § 390.40 of Chapter III of this title.

(c) *Withdrawal of certification.* See § 177.824(i) of this subchapter.

(d) A copy of retest and inspection reports required by §§ 173.33 and 177.824 of this subchapter and all records of repairs to each cargo tank vessel must be retained in the same file with the manufacturer's certificate or manufacturer's data report for that tank as specified in paragraph (a) of this section. This provision does not apply to a motor carrier leasing a cargo tank for less than 30 days if the lessor has the records required by this section in his files.

[Amdt. 177-31, 39 FR 41742, Dec. 2, 1974, as amended by Amdt. 177-35, 41 FR 17736, Apr. 28, 1976; Amdt. 177-37, 41 FR 40691, Sept. 20, 1976]

§ 177.815 Lost or destroyed labels.

Each carrier shall maintain an adequate supply of the labels specified in Subpart E of Part 172 of this subchapter to replace those that become lost or destroyed. The carrier shall replace each lost or destroyed label based on the information on the shipping papers.

[Amdt. 177-35, 41 FR 16130, Apr. 15, 1976]

§ 177.816 Training.

(a) *Applicability.* No carrier may transport a flammable cryogenic liquid in a cargo tank on a public highway unless the driver of the vehicle has received the training specified in paragraph (b) of this section. This section applies only to an originating carrier when an interchange operation is involved.

(b) *Training required.* Each carrier subject to paragraph (a) of this section must:

(1) Provide the required training in written form;

(2) Provide the required training before a driver may drive a motor vehicle transporting a flammable cryogenic liquid in a cargo tank and at least one every 24 months thereafter;

(3) Include in the training program instructions pertaining to:

(i) Requirements in this subchapter applicable to cryogenic liquids, generally;

(ii) Requirements in the Federal Motor Carrier Safety Regulations, Parts 390-397 of this title, applicable to drivers;

(iii) The properties and potential hazards of the particular material to be transported;

(iv) The safe operation of the type of cargo tank the driver will be operating, including its handling characteristics, emergency features and loading limitations; and

(v) Procedures to be followed in case of accident or other emergency, including unanticipated pressure increase or decrease.

(c) *Record of training.* A record certifying that current training has been provided in accordance with paragraph (b) of this section shall be retained in the driver's qualification file (see § 391.51 of this title) for as long as the driver is employed by that carrier and for 90 days thereafter. The record shall include:

(1) The driver's name and operators license number;

(2) The date the driver was provided the training and the due date for subsequent training;

(3) A copy of the written training material required by paragraph (b) of this section or a reference indicating the location of a readily available copy; and

(4) The name and address of the person providing the training.

(Approved by the Office of Management and Budget under control number 2137-0540)

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 177-60, 48 FR 27699, 27713, June 16, 1983]

§ 177.817 Shipping papers.

(a) *General requirements.* A carrier may not transport a hazardous material unless it is accompanied by a shipping paper that is prepared in accordance with §§ 172.200, 172.201, 172.202, and 172.203 of this subchapter.

(b) *Shipper certification.* An initial carrier may not accept a hazardous material offered for transportation unless the shipping paper describing the material includes a shipper's certification which meets the requirements in § 172.204 of this subchapter. Except for a hazardous waste, the certification is not required for shipments to be transported entirely by private carriage and for bulk shipments to be transported in a cargo tank supplied by the carrier.

(c) *Requirements when interlining with carriers by rail.* A motor carrier shall mark on the shipping paper required by this section, if it offers or delivers a freight container or transport vehicle to a rail carrier for further transportation:

(1) A description of the freight container or transport vehicle; and

(2) The kind of placard affixed to the freight container or transport vehicle.

(d) This section does not apply to any material, other than a hazardous substance or a hazardous waste, that is classed as an ORM-A, B, C or D. (See § 172.200 of this subchapter.)

(e) *Shipping paper accessibility—accident or inspection.* A driver of a motor vehicle containing hazardous material, and each carrier using such a vehicle, shall ensure that the shipping paper required by this section is readily available to, and recognizable by, authorities in the event of accident or inspection. Specifically, the driver and the carrier shall:

(1) Clearly distinguish the shipping paper, if it is carried with other shipping papers or other papers of any kind, by either distinctively tabbing it or by having it appear first; and

(2) Store the shipping paper as follows:

(i) When the driver is at the vehicle's controls, the shipping paper shall be: (A) Within his immediate reach while he is restrained by the lap belt; and (B) either readily visible to a person entering the driver's compartment or in a holder which is mounted to the inside of the door on the driver's side of the vehicle.

(ii) When the driver is not at the vehicle's controls, the shipping paper shall be: (A) In a holder which is mounted to the inside of the door on the driver's side of the vehicle; or (B) on the driver's seat in the vehicle.

[Amdt. 177-35, 41 FR 16130, Apr. 15, 1976, as amended by Amdt. 177-35A, 41 FR 40691, Sept. 20, 1976; Amdt. 177-48, 45 FR 47670, Nov. 10, 1980; Amdt. 177-65, 50 FR 11055, Mar. 19, 1985]

§ 177.818 Special instructions; flammable cryogenic liquids.

(a) No carrier may operate, and no driver may drive, a motor vehicle transporting a flammable cryogenic liquid in a package exceeding 125 gallons water capacity unless written instructions containing the following information are carried with the required shipping papers:

(1) General precautions,

(2) Manual venting instructions,

(3) Emergency procedures, and

(4) The names and telephone numbers of persons to be contacted in case of emergency or accident.

(Approved by the Office of Management and Budget under control number 2137-0539)

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 177-60, 48 FR 27700, 27713, June 16, 1983; 48 FR 50442, Nov. 1, 1983]

§ 177.821 Hazardous materials forbidden or limited for transportation.

(a) *Nitroglycerin, desensitized liquid nitroglycerin or diethylene glycol dinitrate forbidden to common carriers.* Liquid nitroglycerin, desensitized liquid nitroglycerin or diethylene glycol dinitrate, except as defined in § 173.53(e) of this chapter, may not be accepted for transportation or be transported by any common carrier by motor vehicle.

(b) *Rejection of leaking containers of liquid nitroglycerin, desensitized liquid nitroglycerin or diethylene glycol dinitrate.* Any individual container used for the transportation of liquid nitroglycerin, desensitized liquid nitroglycerin or diethylene glycol dinitrate, or any boot used therewith, found in such a condition as to permit leakage, shall be discarded and shall not thereafter be repaired for further use.

(c) *Hazardous materials forbidden or limited for transportation.* No motor carrier may accept for transportation or transport any hazardous material listed in Hazardous Materials Table (§ 172.101 of this chapter), as "forbidden" for transportation by all motor carriers; nor, if there be any prohibition or limitation regarding the transportation of any particular hazardous material by a particular kind of motor carrier, may any such article be accepted for transportation or be transported by that kind of carrier, except as indicated in this part. (See § 177.870.)

(d) *Leaking or damaged packages of high explosive must not be accepted for transportation or transported.* Should any package of high explosive when offered for shipment show excessive dampness or be moldy or show outward signs of any oily stain or other indication that absorption of the liquid part of the explosive is not perfect, or that the amount of the liquid part is greater than the absorbent can carry, the package must be refused in every instance. The shipper must substantiate any claim that a stain is due to contact with material other than the liquid explosive ingredient of the explosive. In case of doubt the package must be rejected.

(e) [Reserved]

(f) Smokeless powder for small arms in quantities not exceeding 100 pounds net weight transported in one car or motor vehicle may be classed as a flammable solid when examined for this classification by the Bureau of Explosives and approved by the Director, OHMT. Maximum quantity in any inside packaging must not exceed 8 pounds and inside packagings must be arranged and protected to prevent simultaneous ignition of the contents. The complete package must be a type examined by the Bureau of Explosives and approved by the Director, OHMT. Each outside package must bear a flammable solid label.

[29 FR 18795, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 177.821, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 177.822 Acceptable articles.

(a) Any motor carrier may accept for transportation or transport any acceptable hazardous materials listed in the Hazardous Materials Table, § 172.101 of this subchapter: *Provided, however*, That no provision of this section shall be so construed as to permit the acceptance or transportation of liquid nitroglycerin, desensitized liquid nitroglycerin or diethylene glycol dinitrate, other than as defined in § 173.53(e) of this subchapter, by any common carrier.

(b) *Liquid nitroglycerin, desensitized liquid nitroglycerin or diethylene glycol dinitrate.* Liquid nitroglycerin, desensitized liquid nitroglycerin or diethylene glycol dinitrate, other than as defined in § 173.53(e) of this subchapter, may be transported only by motor carriers other than common carriers in containers complying with specification MC200 (§ 178.315 of this subchapter). No form of trailer may be attached.

[29 FR 18795, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 177-35, 41 FR 16130, Apr. 15, 1976; Amdt. 177-43 43 FR 48645, Oct. 19, 1978]

§ 177.823 Marking and placarding motor vehicles.

(a) A carrier may not move a transport vehicle containing a hazardous material unless the vehicle is marked and placarded in accordance with Part 172 or as authorized in § 171.12a of this subchapter, or unless, in an emergency:

(1) The vehicle is escorted by a representative of a state or local government;

(2) The carrier has permission from the Department; or

(3) Movement of the transport vehicle is necessary to protect life or property.

[Amdt. 177-35, 41 FR 16130, Apr. 15, 1976, as amended by Amdt. 177-67, 50 FR 41521, Oct. 11, 1985]

§ 177.824 Retesting and inspection of cargo tanks.

(a) *General.* In accordance with § 173.33 of this subchapter (cargo tank use authorization) every cargo tank and every compartment of a cargo tank authorized as a qualified container, except those cargo tanks having a capacity of 3,000 gallons or less used exclusively for the transportation of flammable liquids, must fulfill the applicable requirements as set forth in this section.

(1) Each cargo tank, except a Specifications MC-330, MC-331, or MC-338 cargo tank, must be in compliance with the testing requirements prescribed in paragraphs (a), (b), (c), and (d) of this section. Each cargo tank must be in accordance with the marking requirement of paragraph (h) of this section.

(2) Every cargo tank whether constructed in accordance with DOT specifications or being operated as a novel tank under exemption authorization shall not continue in service unless it has successfully fulfilled the testing requirements as set forth in this section.

(b) *Visual inspection requirements.* Every cargo tank shall receive an external visual inspection at least once in every 2-year period. The first such inspection shall be required at the time the next hydrostatic retest is due or prior to January 31, 1969, whichever comes first. This inspection shall be made by a responsible and experienced inspector who shall record the condition of the items set forth below. The inspection record shall be approved and signed by an authorized representative of the owner or operator. A written report of each inspection shall be retained in carrier's or owner's files for a period of 2 years after the date of inspection. Where insulation precludes external visual inspection, the cargo tank shall receive a visual internal inspection for corroded areas, defects in welds or tank sheets. Where visual inspection is precluded by both internal coating and external insulation or when the cargo tank is not equipped with a manhole, the tank shall be hydrostatically tested at 5-year intervals except as otherwise provided in paragraph (c) of this section. The tank shall not be placed in or returned to service if evidence of any unsafe condition is discovered and until such condition has been corrected. Inspection shall consist of the following items:

(1) The tank shall be inspected for: Corroded areas, bad dents, and defects in welds; defects in piping, valves, and gaskets; and other conditions, including leakage, which indicate weakness

in the tank that might render it unsafe for transportation service.

(2) Devices for tightening manhole covers must be operative and leakage at manhole covers and gaskets must be corrected.

(3) Spring-loaded safety-relief valves rated in excess of 7 p.s.i.g. shall be removed from the cargo tank and tested.

(4) All emergency devices and valves must be free from corrosion, distortion, and any damage which will prevent their normal operation.

(5) Missing or loose bolts or nuts on any flanged connection or blank flange must be replaced or tightened.

(6) Required markings on the tank shall be legible.

(7) The entire vehicle shall be inspected for and comply with the Motor Carrier Safety Regulations, Part 393, Chapter III, of this title.

(c) *Hydrostatic or pneumatic testing requirements.* In addition to the visual inspection requirements as contained in paragraph (b) of this section, hydrostatic or pneumatic testing of cargo tanks (or compartments) is required to be conducted in accordance with the provisions contained in paragraph (d) of this section to qualify as an authorized container if:

(1) The cargo tank has been out of service (transporting dangerous articles) 1 year or more, or

(2) The cargo tank has been involved in an accident in which it may have been dented, torn, or otherwise damaged so as to affect its product retention integrity, or

(3) The shell of the cargo tank as originally manufactured has been modified, or

(4) The cargo tank is operating under exemption authorization. Such tanks shall be hydrostatically tested once every calendar year unless otherwise provided for in the exemption, and shall successfully fulfill the requirements set forth in paragraph (d) of this section. No two such required tests shall be closer than 6 months.

(d) *Hydrostatic or pneumatic testing procedure.* The requalification as an authorized container of cargo tanks (or compartments) required to be hydrostatically or pneumatically tested in accordance with paragraph (a) of this section shall be based on successfully meeting the requirements of this paragraph.

(1) *General.* (i) If a cargo tank is compartmented each compartment shall be similarly tested with the adjacent compartment empty and at atmospheric pressure.

(ii) All closures shall be in place while the test is being made. During the test all relief devices shall be clamped, plugged or otherwise rendered inoperative. Relief devices shall be returned to their operative condition immediately after the tests are completed.

(iii) The tank or compartment must hold the prescribed pressure for at least 10 minutes. All tank valves, piping, and other accessories in communication with the lading must be pressure tested and proven tight at the tank design pressure.

(iv) All pressure bearing portions of the heating system of a cargo tank (or compartment) employing such media as steam or hot water for heating the lading shall be tested under hydrostatic pressure and proven to be tight at 14.06 kg./sq. cm (200 psig). Systems employing flues for heating the lading shall be suitably tested to insure against product leakage into the flues or into the atmosphere.

(2) *Hydrostatic test.* For Hydrostatic testing, the tank (including its domes, if any) must be completely filled with water or a liquid having a viscosity similar to water. Pressure must be gauged at the top of the tank applied in accordance with Table I following paragraph (d)(3) of this section.

(3) *Pneumatic test.* Pneumatic pressure must be applied in accordance with Table I of this paragraph. During the pneumatic test the entire surface of all joints under pressure must be coated with a solution of soap and water, heavy oil, or other materials suitable for the purpose of foaming or bubbling to indicate the presence of leaks. Other methods equally sensitive for determining leaks may be used.

TABLE I

Container type	Test pressure KG/SQ CM
MC 300, 301, 302, 303, 305, 306	0.2109 (3 psig).
MC 304, 307	1.76 [1] (25 [1] psig)

TABLE I—Continued

Container type	Test pressure KG/SQ CM
MC 310, 311, 312	0.2109[1] (3[1] psig)

[1] Or 1½ times design pressure whichever is greater.

(4) *Required results.* A cargo tank (or compartment) required to be hydrostatically or pneumatically tested in accordance with paragraph (a) of this section may not be returned to service as a specification cargo tank unless it has successfully retained the applicable test pressure (see Table I in paragraph (d)(3) of this section) without leakage, undue distortion, excessive permanent expansion, or evidence of impending failure. The suitability of any repairs shall be determined by the same method of test.

(i) Cargo tanks (or compartments) with heating systems shall successfully withstand the hydrostatic pressure and examination specified in paragraph (d)(1)(iv) of this section.

(e) *Compressed gas and cryogenic liquid cargo tanks, specifications MC-330, MC-331, and MC-338.* (1) *Specification MC-330 and MC-331.* Each cargo tank constructed in compliance with specification MC-330 or MC-331 (§ 178.337 of this subchapter) must be inspected and tested in accordance with § 173.33 of this subchapter.

(2) *Specification MC-338 insulated cargo tanks.* Each insulated cargo tank constructed in compliance with specification MC-338 (§ 178.338 of this subchapter) must be tested, except for the retest pressure, in accordance with § 178.338-16(a) of this subchapter, and must be in compliance with § 173.33 of this subchapter. If the tank is opened for any reason, the cleanliness must be verified after closure in accordance with § 178.338-15.

(f) *Reporting requirements.* Each motor carrier shall file with the Director, Bureau of Motor Carrier Safety, Federal Highway Administration, Department of Transportation, Washington, D.C. 20590, a written listing of all MC 330 and MC 331 cargo tanks he has in service. Each motor carrier, upon placing in service or withdrawing from service any MC 330 and MC 331 cargo tank (other than a cargo tank used in interchange service which is reported upon by another carrier), shall file a supplemental report with the Bureau.

(1) The initial listing and each subsequent report must include the following information:

(i) The carrier's name, address, and telephone number.

(ii) One of the following statements: "Cargo tank placed in service" or "Cargo tank withdrawn from service," as appropriate, followed by the date of placement or removal;

(iii) The carrier's equipment number, manufacturer's name, manufacturer's serial number, specification MC 330 or MC 331, and "QT" (quenched and tempered) or "NQT" (not quenched and tempered).

(2) A copy of each report required by this paragraph must be retained by the carrier at its principal place of business during the period the tank is in the carrier's service and for 1 year thereafter. However, upon a written request to, and with the approval of, the Director, Regional Motor Carrier Safety Office, for the region in which a motor carrier has his principal place of business, the carrier may maintain the reports at a regional or terminal office.

(g) *Special testing required by the Department.* Upon the showing of probable cause of the necessity for retest, the Department may require any cargo tank to be retested at any time in accordance with the requirements prescribed for its periodic retest.

(h) *Test and inspection date markings.* The month and year of the last test or visual inspection, as appropriate, must be durably and legibly marked on the tank in letters not less than 1¼ inches high. These markings must be near the metal certification plate.

(i) *Withdrawal of certification.* If, as the result of an accident or for any other reason a cargo tank no longer meets the applicable specification, the carrier shall remove the metal certification plate or make it illegible (see § 173.24(c)(1)(v) of this subchapter). The details of the conditions necessitating withdrawal of the certification must be recorded and signed on the written certificate for that cargo tank.

The vehicle owner shall retain the certificate for at least 1 year after withdrawal of the certification.

(49 U.S.C. 1803, 1804, 1808, 49 CFR 1.53, App. A to Part 1)

[29 FR 18795, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

Editorial Note: For Federal Register citations affecting § 177.824, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 177.825 Routing and training requirements for radioactive materials.

(a) The carrier shall ensure that any motor vehicle which contains a radioactive material for which placarding is required is operated on routes that minimize radiological risk. The carrier shall consider available information on accident rates, transit time, population density and activities, time of day and day of week during which transportation will occur. In performance of this requirement the carrier shall tell the driver that the motor vehicle contains radioactive materials and shall indicate the general route to be taken. This requirement does not apply when:

(1) There is only one practicable highway route available, considering operating necessity and safety, or

(2) The motor vehicle is operated on a preferred highway under conditions described in paragraph (b) of this section.

(b) Unless otherwise permitted by this section, a carrier and any person who operates a motor vehicle containing a package of highway route controlled quantity radioactive materials as defined in § 173.403(l) of this subchapter shall ensure that the vehicle operates over preferred routes selected to reduce time in transit, except that an Interstate System bypass or beltway around a city shall be used when available.

(1) A preferred route consists of:

(i) An Interstate System highway for which an alternative route is not designated by a State routing agency as provided in this section, and

(ii) A State-designated route selected by a State routing agency (see § 171.8 of this subchapter) in accordance with the DOT "Guidelines for Selecting Preferred Highway Routes for Shipments of Large Quantity Radioactive Materials".

(2) When a deviation from a preferred route is necessary (including emergency deviation, to the extent time permits), routes shall be selected in accordance with paragraph (a) of this section. A motor vehicle may deviate from a preferred route under any of the following circumstances:

(i) Emergency conditions that would make continued use of the preferred route unsafe.

(ii) To make necessary rest, fuel and vehicle repair stops.

(iii) To the extent necessary to pick up, deliver or transfer a highway route controlled quantity package of radioactive materials.

(c) A carrier (or his agent) who operates a motor vehicle which contains a package of highway route controlled quantity radioactive materials as defined in § 173.403(l) of this subchapter shall prepare a written route plan and supply a copy before departure to the motor vehicle driver and a copy to the shipper (before departure for exclusive use shipments, or otherwise within fifteen working days following departure). Any variation between the route plan and routes actually used, and the reason for it, shall be reported in an amendment to the route plan delivered to the shippper as soon as practicable but within 30 days following the deviation. The route plan shall contain:

(1) A statement of the origin and destination points, a route selected in compliance with this section, all planned stops, and estimated departure and arrival times; and

(2) Telephone numbers which will access emergency assistance in each State to be entered.

(d) No person may transport a package of highway route controlled quantity radioactive materials as defined in § 173.403(l) of this subchapter, on a public highway unless:

(1) The driver has received within the two preceding years, written training on:

(i) Requirements in Parts 172, 173, and 177 of this subchapter pertaining to the radioactive materials transported;

(ii) The properties and hazards of the radioactive materials being transported; and

(iii) Procedures to be followed in case of an accident or other emergency.

(2) The driver has in his immediate possession a certificate of training as evidence of training required by this section, and a copy is placed in his qualification file (see § 391.51 of this title), showing:

(i) The driver's name and operator's license number;

(ii) The dates training was provided;

(iii) The name and address of the person providing the training;

(iv) That the driver has been trained in the hazards and characteristics of highway route controlled quantity radioactive materials; and

(v) A statement by the person providing the training that information on the certificate is accurate.

(3) The driver has in his immediate possession the route plan required by paragraph (c) of this section and operates the motor vehicle in accordance with the route plan.

(e) A person may transport irradiated reactor fuel only in compliance with a plan if required under § 173.22(c) of this subchapter that will ensure the physical security of the material. Variation for security purposes from the requirements of this section is permitted so far as necessary to meet the requirements imposed under such a plan, or otherwise imposed by the U.S. Nuclear Regulatory Commission in 10 CFR Part 73.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 177-52, 46 FR 5316, Jan. 19, 1981, as amended by Amdt 177-57, 48 FR 10247, Mar. 10, 1983; Amdt. 177-58, 48 FR 17094, Apr. 21, 1983]

§ 177.826 Carrier's registration statement; flammable cryogenic liquids.

(a) No person may transport a flammable cryogenic liquid in a portable tank or a cargo tank unless he has filed a registration statement by certified mail, return receipt requested, with the Director, OHMT, RSPA in accordance with paragraphs (b), (c) and (d) of this section.

(b) The registration statement must contain the following information:

(1) The carrier's name and principal place of business.

(2) Locations where cargo tanks used to transport flammable cryogenic liquids are domiciled.

(3) The serial number or vehicle identification number of each cargo tank used by the carrier to transport flammable cryogenic liquids, and the name of each flammable cryogenic liquid transported in each cargo tank.

(c) The registration statement must be filed:

(1) Initially between January 1 and February 28, 1985 (this initial statement is only required to contain information regarding operations that took place during the 90 days prior to the date of the statement); and

(2) Subsequently, between January 1 and February 28 of each odd numbered year after 1985.

(d) For equipment obtained or operations begun between the two-year filing intervals specified in paragraph (c) of this section, the information must be provided on the registration statement filed during the next required filing period.

(Approved by the Office of Management and Budget under control number 2137-0541)

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 177-66, 48 FR 27700, 27713, June 16, 1983; 48 FR 50442, Nov. 1, 1983]

Subpart B—Loading and Unloading

NOTE: For prohibited loading and storage of hazardous materials, see § 177.848.

§ 177.834 General requirements.

(a) *Packages secured in a vehicle.* Any tank, barrel, drum, cylinder, or other packaging, not permanently attached to a motor vehicle, which contains any flammable liquid, compressed gas, corrosive material, poisonous material, or radioactive material must be secured against movement within the vehicle on which it is being transported, under conditions normally incident to transportation.

(b) *No hazardous materials on pole trailers.* No hazardous materials may be loaded into or on or transported in or on any pole trailer.

(c) *No smoking while loading or unloading.* Smoking on or about any motor vehicle while loading or unloading any explosive, flammable liquid, flammable solid, oxidizing material, or flammable compressed gas is forbidden.

(d) *Keep fire away, loading and unloading.* Extreme care shall be taken in the loading or unloading of any explosive, flammable liquid, flammable solid oxidizing material, or flammable compressed gas into or from any motor vehicle to keep fire away and to prevent persons in the vicinity from smoking lighting matches, or carrying any flame or lighted cigar, pipe, or cigarette.

(e) *Handbrake set while loading and unloading.* No hazardous material shall be loaded into or on, or unloaded from, any motor vehicle unless the handbrake be securely set and all other reasonable precautions be taken to prevent motion of the motor vehicle during such loading or unloading process.

(f) *Use of tools, loading and unloading.* No tools which are likely to damage the effectiveness of the closure of any package or other container, or likely adversely to affect such package or container, shall be used for the loading or unloading of any explosive or other dangerous article.

(g) *Prevent relative motion between containers.* Containers of explosives, flammable liquids, flammable solids, oxidizing materials, corrosive materials, compressed gases, and poisonous liquids or gases, must be so braced as to prevent motion thereof relative to the vehicle while in transit. Containers having valves or other fittings must be so loaded that there will be the minimum likelihood of damage thereto during transportation.

(h) *Precautions concerning containers in transit; fueling road units.* Reasonable care should be taken to prevent undue rise in temperature of containers and their contents during transit. There must be no tampering with such container or the contents thereof nor any discharge of the contents of any container between point of origin and point of billed destination. Discharge of contents of any container, other than a cargo tank, must not be made prior to removal from the motor vehicle. Nothing contained in this paragraph shall be so construed as to prohibit the fueling of machinery or vehicles used in road construction or maintenance.

(i) *Attendance requirements.* (1) *Loading.* A cargo tank must be attended by a qualified person at all times when it is being loaded. The person who is responsible for loading the cargo tank is also responsible for ensuring that it is so attended.

(2) *Unloading.* A motor carrier who transports hazardous materials by a cargo tank must ensure that the cargo tank is attended by a qualified person at all times during unloading. However, the carrier's obligation to ensure attendance during unloading ceases when:

(i) The carrier's obligation for transporting the materials is fulfilled;

(ii) The cargo tank has been placed upon the consignee's premises; and

(iii) The motive power has been removed from the cargo tank and removed from the premises.

(3) A person "attends" the loading or unloading of a cargo tank if, throughout the process, he is awake, has an unobstructed view of the cargo tank, and is within 7.62 meters (25 feet) of the cargo tank.

(4) A person is "qualified" if he has been made aware of the nature of the hazardous material which is to be loaded or unloaded, he has been instructed on the procedures to be followed in emergencies, he is authorized to move the cargo tank, and he has the means to do so.

(5) A delivery hose, when attached to the cargo tank, is considered a part of the vehicle.

(j) *Prohibited loading combinations* In any single driven motor vehicle or in any single unit of a combination of motor vehicles, hazardous materials shall not be loaded together if prohibited by loading and storage chart, § 177.848. This section shall not be so construed as to forbid the carrying of materials essential to safe operation of motor vehicles. (See Motor Carrier Safety Regulations Part 393 of this title.)

(k) *Access to mixed ladings.* Flammable solids, oxidizing materials, or corrosive liquids, when transported on a motor vehicle with other lading not otherwise forbidden, shall be so loaded as to provide ready access thereto for shifting or removal.

(l) *Use of cargo heaters when transporting certain hazardous material.* Transportation includes loading, carrying, and unloading.

(1) *When transporting explosives.* A motor vehicle equipped with a cargo heater of any type may transport explosives only if the cargo heater is rendered inoperable by: (i) Draining or removing the cargo heater fuel tank; and (ii) disconnecting the heater's power source.

(2) *When transporting certain flammable material*—(i) *Use of combustion cargo heaters.* A motor vehicle equipped with a combustion cargo heater may be used to transport flammable liquid or flammable gas only if each of the following requirements are met:

(A) It is a catalytic heater.

(B) The heater's surface temperature cannot exceed 130° F. (54° C.)—either on a thermostatically controlled heater or on a heater without thermostatic control when the outside or ambient temperature is 60° F. (15.6° C.) or less.

(C) The heater is not ignited in a loaded vehicle.

(D) There is no flame, either on the catalyst or anywhere in the heater.

(E) The manufacturer has certified that the heater meets the requirements under paragraph (l)(2)(i) of this section by permanently marking the heater "*MEETS DOT REQUIREMENTS FOR CATALYTIC HEATERS USED WITH FLAMMABLE LIQUID AND GAS.*"

(F) The heater is also marked "*DO NOT LOAD INTO OR USE IN CARGO COMPARTMENTS CONTAINING FLAMMABLE LIQUID OR GAS IF FLAME IS VISIBLE ON CATALYST OR IN HEATER.*"

(G) Heater requirements under § 393.77 of this title are complied with.

(ii) *Effective date for combustion heater requirements.* The requirements under paragraph (l)(2)(i) of this section govern as follows:

(A) Use of a heater manufactured after November 14, 1975, is governed by every requirement under (l)(2)(i) of this section;

(B) Use of a heater manufactured before November 15, 1975, is governed only by the requirements under (l)(2)(i) (A), (C), (D), (F) and (G) of this section until October 1, 1976; and

(C) Use of any heater after September 30, 1976, is governed by every requirement under paragraph (l)(2)(i) of this section.

(iii) *Restrictions on automatic cargo-space-heating temperature control devices.* Restrictions on these devices have two dimensions: Restrictions upon use and restrictions which apply when the device must not be used.

(A) *Use restrictions.* An automatic cargo-space-heating temperature control device may be used when transporting flammable liquid or flammable gas only if each of the following requirements is met:

(*1*) Electrical apparatus in the cargo compartment is nonsparking or explosion proof.

(*2*) There is no combustion apparatus in the cargo compartment.

(*3*) There is no connection for return of air from the cargo compartment to the combustion apparatus.

(*4*) The heating system will not heat any part of the cargo to more than 130° F. (54° C.).

(*5*) Heater requirements under § 393.77 of this title are complied with.

(B) *Protection against use.* Flammable liquid or flammable gas may be transported by a vehicle, which is equipped with an automatic cargo-space-heating temperature control device that does not meet each requirement of paragraph (l)(2)(iii)(A) of this section, only if the device is first rendered inoperable, as follows:

(*1*) Each cargo heater fuel tank, if other than LPG, must be emptied or removed.

(*2*) Each LPG fuel tank for automatic temperature control equipment must have its discharge valve closed and its fuel feed line disconnected.

(m) Tanks constructed and maintained in compliance with Spec. 106A or 110A (§§ 179.300, 179.301 of this subchapter) that are authorized for the shipment of hazardous materials by highway in Part 173 of this subchapter must be carried in accordance with the following requirements:

(1) Tanks must be securely checked or clamped on vehicles to prevent any shifting.

(2) Equipment suitable for handling a tank must be provided at any point where a tank is to be loaded upon or removed from a vehicle.

(3) No more than two cargo carrying vehicles may be in the same combination of vehicles.

(4) Compliance with §§ 174.200 and 174.204 of this subchapter for combination rail freight, highway shipments and for trailer-on-flat-car service is required.

(n) Specification 56, 57, IM 101, and IM 102 portable tanks, when loaded, may not be stacked on each other nor placed under other freight during transportation by motor vehicle.

[29 FR 18795, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 177.834, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 177.835 Explosives.

(See also § 177.834 (a) to (k).)

(a) *Engine stopped.* No explosives shall be loaded into or on or be unloaded from any motor vehicle with the engine running.

(b) *Care in loading, unloading, or other handling of explosives.* No bale hooks or other metal tools shall be used for the loading, unloading or other handling of explosives, nor shall any package or other container of explosives, except barrels or kegs, be rolled. No packages of explosives shall be thrown or dropped during process of loading or unloading or handling of explosives. Special care shall be exercised to the end that packages or other containers containing explosives shall not catch fire from sparks or hot gases from the exhaust tailpipe.

(1) Whenever tarpaulins are used for covering explosives, they shall be secured by means of rope, wire, or other equally efficient tie downs. Explosives placards or markings required by § 177.823 shall be secured, in the appropriate locations, directly to the equipment transporting the explosives. If the vehicle is provided with placard boards, the placards must be applied to these boards.

(c) *Explosives on vehicles in combination.* Class A explosives may not be loaded into or carried on any vehicle or a combination of vehicles if:

(1) More than two cargo carrying vehicles are in the combination;

(2) Any full trailer in the combination has a wheel base of less than 184 inches;

(3) Any vehicle in the combination is a tank motor vehicle which is required to be marked or placarded under § 177.823; or

(4) The other vehicle in the combination contains any:

(i) Initiating explosive,

(ii) Packages of radioactive materials bearing "Yellow III" labels,

(iii) Class A or B poisons, or

(iv) Hazardous materials in a portable tank or a DOT specification 106A or 110A tank.

(d) [Reserved]

(e) *No sharp projections inside body of vehicles.* No motor vehicle transporting any kind of explosive shall have on the interior of the body in which the explosives are contained, any inwardly projecting bolts, screws, nails, or other inwardly projecting parts likely to produce damage to any package or container of explosives during the loading or unloading process or in transit.

(f) *Explosives vehicles, floors tight and lined.* Motor vehicles transporting class A or class B explosives shall have tight floors; shall have that portion of the interior in contact with the load lined with either non-metallic material or non-ferrous metals, except that the lining is not required for truck load shipments loaded by the Departments of the Army, Navy or Air Force of the United States Government provided the explosives are of such nature that they are not liable to leakage of dust, powder, or vapor which might become the cause of an explosion. The interior of the cargo space must be in good condition so that there will not be any likelihood of containers being damaged by exposed bolts, nuts, broken side panels or floor boards, or any similar projections.

(g) No detonating primer may be transported on the same motor vehicle with any class A or class B explosive (except other detonating primers or detonators), blasting agent or detonating cord, class C explosive. No detonator may be transported on the same motor vehicle with any class A or class B explosive (except other detonators or detonating primers), blasting agent or detonating cord, class C explosive unless—

(1) It is packed in a specification MC 201 (§ 178.318 of this subchapter) container, or

(2) The package conforms with requirements prescribed in § 173.103(d) of this subchapter, and its use is restricted to instances when—

(i) There is no class A or class B explosive or blasting agent loaded on the motor vehicle; and

(ii) A separation of 24 inches is maintained between each package of detonators and each package of detonating cord; or

(3) It is packed and loaded in accordance with a method approved by the Department. One method approved by the Department is as follows:

(i) The detonators are in packagings as prescribed in § 173.66 of this subchapter which in turn are loaded into suitable containers or separate compartments. Both the detonators and the container or compartment must meet the requirements of the Institute of Makers of Explosives' Standard (IME Safety Library Publication No. 22).

(h) *Lading within body or covered tailgate closed.* Except as provided in paragraphs (g), (k), and (m) of this section, dealing with the transportation of liquid nitroglycerin, desensitized liquid nitroglycerin or diethylene glycol dinitrate, other than as defined in § 173.53(e) of this subchapter, all of that portion of the lading of any motor vehicle which consists of explosives shall be contained entirely within the body of the motor vehicle or within the horizontal outline thereof, without overhang or projection of any part of the load and if such motor vehicle has a tailboard or tailgate, it shall be closed and secured in place during such transportation. Every motor vehicle transporting explosives must either have a closed body or have the body thereof covered with a tarpaulin, and in either event care must be taken to protect the load from moisture and sparks, except that subject to other provisions of these regulations, explosives other than black powder may be transported on flat-bed vehicles if the explosive portion of the load on each vehicle is packed in fire and water resistant containers or covered with a fire and water resistant tarpaulin.

(i) *Explosives to be protected against damage by other lading.* No motor vehicle transporting any explosive may transport as a part of its load any metal or other articles or materials likely to damage such explosive or any package in which it is contained, unless the different parts of such load be so segregated or secured in place in or on the motor vehicle and separated by bulkheads or other suitable means as to prevent such damage.

(j) *Transfer of explosives en route.* No class A or class B explosive shall be transferred from one container to another, or from one motor vehicle to another vehicle, or from another vehicle to a motor vehicle, on any public highway, street, or road, except in case of emergency. In such cases red electric lanterns, red emergency reflectors or red flags shall be set out in the manner prescribed for disabled or stopped motor vehicles. (See Motor Carrier Safety Regulations, Part 392 of this title.) In any event, all practicable means, in addition to these hereinbefore prescribed, shall be taken to protect and warn other users of the highway against the hazard involved in any such transfer or against the hazard occasioned by the emergency making such transfer necessary.

(k) *Loading requirements for liquid nitroglycerin, desensitized liquid nitroglycerin, or diethylene glycol dinitrate.* Liquid nitroglycerin, desensitized liquid nitroglycerin, or diethylene glycol dinitrate, other than as defined in § 173.53(e) of this chapter, may be accepted for transportation and transported only by motor carriers other than common carriers if it be loaded into or on a truck having the type of body specified in Spec. MC200 (§ 178.315 of this subchapter). No liquid nitroglycerin, desensitized liquid nitroglycerin or diethylene glycol dinitrate may be loaded directly above any other explosive, or in any quantity in excess of 900 quarts on one motor vehicle or 10 quarts in any one individual container. Additional quantities of explosives, other than nitroglycerin, desensitized liquid nitroglycerin or diethylene glycol dinitrate, excepting any type of blasting or percussion cap or other detonating device, may be carried on such motor vehicle in a closed or covered bed or body which shall be firmly bolted or fastened above the lid of the compartment containing the nitroglycerin, desensitized liquid nitroglycerin or diethylene glycol dinitrate. In no case shall the net load be more than 7,500 pounds. (See paragraph (m) of this section and Spec. MC201 (§ 178.318 of this subchapter).

(l) *Separation of tools and supplies for preparing charges.* Motor vehicles transporting liquid nitroglycerin; desensitized liquid nitroglycerin or diethylene glycol dinitrate, may also transport the tools and supplies necessary for preparing and firing charges thereof: *Provided,* That such tools and supplies be properly secured in place so as to prevent their coming in contact with the body above specified.

(m) *Detonators or other explosives.* Any explosive, including desensitized liquid explosives as defined in § 173.53(e) of this subchapter, other than liquid nitroglycerin, desensitized nitroglycerin or diethylene glycol dinitrate, transported on any motor vehicle transporting liquid nitroglycerin, desensitized liquid nitroglycerin or diethylene glycol dinitrate, must be segregated, each kind from every other kind, and from tools or other supplies. Detonators must be packed in specification MC 201 (§ 178.318 of this subchapter) containers.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[29 FR 18795, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 177.835, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 177.836 Nonexplosive material.

(a) No restrictions are prescribed in Parts 170-189 of this subchapter for the packing, handling, and transportation of material relating to ammunition for cannon, but containing no explosive or other dangerous article, such as cartridge cases, "dummy" or "drill" cartridges, etc., sandloaded projectiles, sand-loaded bombs, empty projectiles, empty mines, empty bombs, solid projectiles, or empty torpedoes. Rotating bands should be protected against deformation by method of packing or loading.

[29 FR 18795, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 177-35, 41 FR 16130, Apr. 15, 1976]

§ 177.837 Flammable liquids.

(See also § 177.834(a) to (k).)

(a) *Engine stopped.* Unless the engine of the motor vehicle is to be used for the operation of a pump, no flammable liquid shall be loaded into, or on, or unloaded from any motor vehicle while the engine is running.

(b) *Bonding and grounding containers other than cargo tanks prior to and during transfer of lading.* For containers which are not in metallic contact with each other, either metallic bonds or ground conductors shall be provided for the neutralization of possible static charges prior to and during transfers of flammable liquids between such containers. Such bonding shall be made by first connecting an electric conductor to the container to be filled and subsequently connecting the conductor to the container from which the liquid is to come, and not in any other order. To provide against ignition of vapors by discharge of static electricity, the latter connection shall be made at a point well removed from the opening from which the flammable liquid is to be discharged.

(c) *Bonding and grounding cargo tanks before and during transfer of lading.* (1) When a cargo tank is loaded through an open filling hole, one end of a bond wire shall be connected to the stationary system piping or integrally connected steel framing, and the other end to the shell of the cargo tank to provide a continuous electrical connection. (If bonding is to the framing, it is essential that piping and framing be electrically interconnected.) This connection must be made before any filling hole is opened, and must remain in place until after the last filling hole has been closed. Additional bond wires are not needed around All-Metal flexible or swivel joints, but are required for nonmetallic flexible connections in the stationary system piping. When a cargo tank is unloaded by a suction-piping system through an open filling hole of the cargo tank, electrical continuity shall be maintained from cargo tank to receiving tank.

(2) When a cargo tank is loaded or unloaded through a vapor-tight (not open hole) top or bottom connection, so that there is no release of vapor at a point where a spark could occur, bonding or grounding, is not required. Contact of the closed connection must be made before flow starts and must not be broken until after the flow is completed.

(3) Bonding or grounding is not required when a cargo tank is unloaded through a nonvapor-tight connection into a stationary tank provided the metallic filling connection is maintained in contact with the filling hole.

(d) *Pyroforic liquids in cylinders.* Cylinders containing pyroforic liquids, unless packed in a strong box or case and secured therein to protect valves, must be loaded with all valves and safety relief devices in the vapor space. All cylinders must be secured so that no shifting may occur in transit.

(e) *Manholes and valves closed.* A person shall not drive a tank motor vehicle and a motor carrier shall not require or permit a person to drive a tank motor vehicle containing a flammable liquid (regardless of quantity) unless:

(1) All manhole closures on the cargo tank are closed and secured; and

(2) All valves and other closures in liquid discharge systems are closed and free of leaks.

[29 FR 18795, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 177.837, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 177.838 Flammable solids and oxidizing materials.

(See also § 177.834 (a) to (k)).

(a) *Lading within body or covered; tailgate closed; pick-up and delivery.* All of that portion of the lading of any motor vehicle transporting flammable solids or oxidizing materials shall be contained entirely within the body of the motor vehicle and shall be covered by such body, by tarpaulins, or other suitable means, and if such motor vehicle has a tailboard or tailgate, it shall be closed and secured in place during such transportation: *Provided, however,* That the provisions of this paragraph need not apply to "pick-up and delivery" motor vehicles when such motor vehicles are used in no other transportation than in and about cities, towns, or villages. Shipment in water-tight bulk containers need not be covered by a tarpaulin or other means.

(b) *Articles to be kept dry.* Special care shall be taken in the loading of any motor vehicle with flammable solids or oxidizing materials which are likely to become hazardous to transport when wet, to keep them from being wetted during the loading process and to keep them dry during transit. Special care shall also be taken in the loading of any motor vehicle with flammable solids or oxidizing materials, which are likely to become more hazardous to transport by wetting, to keep them from being wetted during the loading process and to keep them dry during transit. Examples of such dangerous materials are charcoal screenings, ground, crushed, or pulverized charcoal, and lump charcoal.

(c) *Lading ventilation, precautions against spontaneous combustion.* Whenever a motor carrier has knowledge concerning the hazards of spontaneous combustion or heating of any article to be loaded on a motor vehicle, such article shall be so loaded as to afford sufficient ventilation of the load to provide reasonable assurance against fire from this cause; and in such a case the motor vehicle shall be unloaded as soon as practicable after reaching its destination. Charcoal screenings, or ground, crushed, granulated, or pulverized charcoal, in bags, shall be so loaded that the bags are laid horizontally in the motor vehicle, and so piled that there will be spaces for effective air circulation, which spaces shall not be less than 4 inches wide; and air spaces shall be maintained between rows of bags. Bags shall not be piled closer than 6 inches from the top of any motor vehicle with a closed body.

(d) *Loose or baled nitrate of soda bags.* Loose or baled unwashed, empty bags, having contained nitrate of soda, may be transported in truckload lots only in motor vehicles, and such motor vehicles must have closed or covered bodies lined with paper; such shipments are required to be loaded by the shipper and to be unloaded by the consignee.

(e) *Staying or blocking of packages of matches.* Special care shall be exercised in the loading of packages containing "strike-anywhere" matches to prevent the shifting or jamming of any such package during transit. To this end, the packages shall be compactly loaded with the strongest dimensions of each box or other container loaded lengthwise of the motor vehicle.

(1) *Smooth vehicle interior for matches.* Unless strike-anywhere matches are contained in wooden outside boxes, special care shall be taken to provide that the inside surfaces of any motor vehicle into which such matches are to be loaded and with which surfaces the containers might come in contact, shall be smooth, without protrusions of any sort, such as bolts, nuts, sharp edges, or corners, etc., and there shall be provided for this purpose smooth wooden inner linings, if the interior of the motor vehicle is not otherwise smooth in accordance with this requirement.

(2) *Flammable liquids.* Matches must not be loaded next to a package bearing a flammable liquid label.

(f) Nitrates, except ammonium nitrate having organic coating, listed in § 173.182(b) of this subchapter must be loaded in closed or open type motor vehicles, which must be swept clean and be free of any projections capable of injuring bags when so packaged. When shipped in open typemotor vehicles, the lading must be suitably covered. Ammonium nitrate having organic coating must not be loaded in all-metal vehicles, other than those made of aluminum or aluminum alloys of the closed type.

(g) Smokeless powder for small arms in quantities not exceeding 100 pounds net weight transported in one car or motor vehicle may be classed as a flammable solid when examined for this classification by the Bureau of Explosives and approved by the Director, OHMT. Maximum quantity in any inside packaging must not exceed 8 pounds and inside packagings must be arranged and protected to prevent simultaneous ignition of the contents. The complete package must be a type examined by the Bureau of Explosives and approved by the Director, OHMT. Each outside packaging must bear a flammable solid label.

[29 FR 18795, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 177.838, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 177.839 Corrosive liquids.

(See also § 177.834 (a) to (k).)

(a) *Nitric acid.* In addition to the requirements set forth in paragraph (b) of this section no carboy or other container of nitric acid shall be loaded above any container containing any other kind of material. The loading of carboys or other containers of nitric acid shall be limited to two tiers high.

(b) *Carboys and frangible containers.* In general, individual carboys and frangible containers of corrosive liquids, including charged electric storage batteries, must, when loaded by hand, be individually loaded into and unloaded from any motor vehicle in which they are to be, or have been, transported. All reasonable precautions must be taken to prevent, by all practicable means, the dropping of any such containers or batteries containing corrosive liquids. No such container or battery may be loaded into a motor vehicle having an uneven floor surface. It shall be permissible to load on or transport in any motor vehicle any authorized carboys or frangible shipping containers, containing corrosive liquids, more than one tier high above any floor only if such carboys or other containers are boxed or crated, or are in barrels or kegs, as required by Parts 170 through 189 of this subchapter, and only if such containers are so stacked that the weight of each tier above the first is entirely supported by the boxes, crates, barrels, kegs, or other authorized means of enclosing the carboys or frangible containers. Only so many tiers as may adequately be so supported without danger of crushing or breaking, shall be permitted. Means must be provided to prevent by all practicable means, in all cases, the shifting of containers or batteries during transit. Nothing contained in this section shall be so construed as to prevent the use of cleats or other retaining means for the purpose of preventing shifting of containers or batteries. For the purposes of this section a false floor or platform, secured against relative motion within the body of the motor vehicle, shall be deemed to be a floor. (For recommendations for handling leaking or broken packages, see § 177.858(a).)

(c) *Storage batteries.* In addition to the requirements set forth in paragraph (b) of this section, all storage batteries containing any electrolyte shall be so loaded, if loaded with other lading, that all such batteries will be protected against other lading falling onto or against them; and adequate means shall be provided in all cases for the protection and insulation of battery terminals against short circuits.

(d) *Corrosives in cargo tanks.* A person shall not drive a tank motor vehicle and a motor carrier shall not require or permit a person to drive a tank motor vehicle containing corrosives (regardless of quantity) unless:

(1) All manhole closures on the cargo tank are closed and secured; and

(2) All valves and other closures in liquid discharge systems are closed and free of leaks.

[29 FR 18795, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 177.839, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 177.840 Compressed gases, including cryogenic liquids.

(See also § 177.834 (a) to (k).)

(a) *Floors or platforms essentially flat.* Cylinders containing compressed gases shall not be loaded onto any part of the floor or platform of any motor vehicle which is not essentially flat; cylinders containing compressed gases may be loaded onto any motor vehicle not having a floor or platform only if such motor vehicle be equipped with suitable racks having adequate means for securing such cylinders in place therein. Nothing contained in this section shall be so construed as to prohibit the loading of such cylinders on any motor vehicle having a floor or platform and racks as hereinbefore described.

(1) *Cylinders.* To prevent their overturning, cylinders containing compressed gases must be securely lashed in an upright position; loaded into racks securely attached to the motor vehicle; packed in boxes or crates of such dimensions as to prevent their overturning; or loaded in a horizontal position. Specification DOT-4L cylinders must be loaded in an upright position and securely braced.

(2) *Cylinders for hydrogen, cryogenic liquid.* A Specification DOT-4L cylinder containing hydrogen, cryogenic liquid may only be transported on a motor vehicle as follows:

(i) The vehicle must have an open body equipped with a suitable rack or support having a means to hold the cylinder upright when subjected to an acceleration of 2 "g" in any horizontal direction;

(ii) The combined total of the hydrogen venting rates, as marked, on the cylinders transported on one motor vehicle may not exceed 60 SCF per hour;

(iii) The vehicle may not enter a tunnel; and

(iv) Highway transportation is limited to private and contract carriage and to direct movement from point of origin to destination.

(b) Portable tank containers containing compressed gases shall be loaded on motor vehicles only as follows:

(1) Onto a flat floor or platform of a motor vehicle.

(2) Onto a suitable frame of a motor vehicle.

(3) In either such case, such containers shall be safely and securely blocked or held down to prevent movement relative to each other or to the supporting structure when in transit, particularly during sudden starts and stops and changes of direction of the vehicle.

(4) Requirements of paragraphs (1) and (2) of this paragraph (b) shall not be construed as prohibiting stacking of containers provided the provisions of paragraph (3) of this paragraph (b) are fully complied with.

(c) [Reserved]

(d) *Engine to be stopped in tank motor vehicles, except for transfer pump.* No flammable compressed gas shall be loaded into or on or unloaded from any tank motor vehicle with the engine running unless the engine is used for the operation of the transfer pump of the vehicle. Unless the delivery hose is equipped with a shut-off valve at its discharge end, the engine of the motor vehicle shall be stopped at the finish of such loading or unloading operation while the filling or discharge connections are disconnected.

(e) Chlorine cargo tanks shall be shipped only when equipped (1) with a gas mask of a type approved by the U.S. Bureau of Mines for chlorine service; (2) with an emergency kit for controlling leaks in fittings on the dome cover plate.

(f) No chlorine tank motor vehicle used for transportation of chlorine shall be moved, coupled or uncoupled, when any loading or unloading connections are attached to the vehicle, nor shall any semi-trailer or trailer be left without the power unit unless such semi-trailer or trailer be chocked or equivalent means be provided to prevent motion.

(g) Each liquid discharge valve on a cargo tank, other than an engine fuel line valve, must be closed during transportation except during loading and unloading.

(h) The driver of a motor vehicle transporting a flammable cryogenic liquid in a package exceeding 125 gallons of water capacity shall avoid unnecessary delays during transportation. If unforeseen conditions cause an excessive pressure rise, the driver shall manually vent the tank at a remote and safe location. For each shipment, the driver shall make a written record of the cargo tank pressure and ambient (outside) temperature:

(1) At the start of each trip,

(2) Immediately before and after any manual venting,

(3) At least once every five hours, and

(4) At the destination point.

(i) No person may transport a flammable cryogenic liquid in a cargo tank unless the pressure of the lading is equal to or less than that used to determine the marked rated holding time (MRHT) and the one-way travel time (OWTT), marked on the tank in conformance with § 173.318(g) of this subchapter, is equal to or greater than the elapsed time between the start and termination of travel. This prohibition does not apply if, prior to expiration of the OWTT, the tank is brought to full equilibration as specified in paragraph (j) of this section.

(j) Full equilibration of a cargo tank transporting a flammable cryogenic liquid may only be done at a facility that loads or unloads a flammable cryogenic liquid and must be performed and verified as follows:

(1) The temperature and pressure of the liquid must be reduced by a manually controlled release of vapor; and

(2) The pressure in the cargo tank must be measured at least ten minutes after the manual release is terminated.

(k) A carrier of carbon monoxide, cryogenic liquid must provide each driver with a self-contained air breathing apparatus that is approved by the National Institute of Occupational Safety and Health; for example, Mine Safety Appliance Co., Model 401, catalog number 461704.

(Approved by the Office of Management and Budget under control number 2137-0542)

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[29 FR 18795, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 177.840, see the List of CFR

Sections Affected appearing in the Finding Aids section of this volume.

§ 177.841 Poisons.

(See also § 177.834 (a) to (k).)

(a) *Arsenical compounds in bulk.* Care shall be exercised in the loading and unloading of "arsenical dust", "arsenic trioxide", and "sodium arsenate", allowable to be loaded into sift-proof, steel hopper-type or dump-type motor-vehicle bodies equipped with water-proof, dust-proof covers well secured in place on all openings, to accomplish such loading with the minimum spread of such compounds into the atmosphere by all means that are practicable; and no such loading or unloading shall be done near or adjacent to any place where there are or are likely to be, during the loading or unloading process assemblages of persons other than those engaged in the loading or unloading process, or upon any public highway or in any public place.

(1) The motor vehicles must be marked in accordance with § 173.350(b) of this chapter.

(2) Before any motor vehicle may be used for transporting any other articles, all detectable traces of arsenical materials must be removed therefrom by flushing with water, or by other appropriate method, and the marking removed.

(b) No Class A or irritating materials in cargo tanks. No poison, Class A, or irritating material may be loaded into or transported in any cargo tank.

(c) *Class A poisons or irritating materials.* The transportation of a Class A poison or an irritating material is not permitted if there is any interconnection between packagings.

(d) *Poisons in cargo tanks.* A person shall not drive a tank motor vehicle and a motor carrier shall not require or permit a person to drive a tank motor vehicle containing poisons (regardless of quantity) unless:

(1) All manhole closures on the cargo tank are closed and secured; and

(2) All valves and other closures in liquid discharge systems are closed and free of leaks.

(e) A carrier may not transport a package bearing a poison label in the same motor vehicle with material that is marked as or known to be foodstuff, feed or any edible material intended for consumption by humans or animals unless the inside package is overpacked in a liquid-tight and dust-proof container identified as package 4000 in the National Motor Freight Classification 100-I.

[29 FR 18795, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 177.841, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 177.842 Radioactive material.

(a) The number of packages of radioactive materials in any motor vehicle, trailer, or storage location must be limited so that the total transport index number, as defined in § 173.403 of this subchapter and determined by adding together the transport index numbers on the labels of the individual packages, does not exceed 50. This provision does not apply to exclusive use shipments described in §§ 173.441(b), 173.457, and 173.425 of this subchapter.

(b) Packages of radioactive material bearing "radioactive yellow-II" or "radioactive yellow-III" labels must not be placed in a motor vehicle or in any other place closer than the distances shown in the following table to any area which may be continuously occupied by passengers, employees, or shipments of animals, nor closer than the distances shown in the table below to any package containing undeveloped film (if so marked). If more than one of these packages is present, the distance shall be computed from the following table on the basis of the total transport index number (determined by adding together the transport index numbers on the labels of the individual packages) or packages in the vehicle or storeroom. Where more than one group of packages is present in any single storage location, a single group may not have a total transport index greater than 50. Each group of packages must be handled and stowed not closer than 6 meters (20 feet) (measured edge to edge) to any other group.

(c) Shipments of low specific activity materials, as defined in § 173.403 of this subchapter, must be loaded so as to avoid spillage and scattering of loose materials. Loading restrictions are set forth in § 173.425 of this subchapter.

(d) Packages must be so blocked and braced that they cannot change position during conditions normally incident to transportation.

Total transport index	Minimum separation distances in feet to nearest undeveloped film for various times of transit					Minimum distance in feet to area of persons, or minimum distance in feet from dividing partition of cargo compartments
	Up to 2 hours	2-4 hours	4-8 hours	8-12 hours	Over 12 hours	
None	0	0	0	0	0	0
0.1 to 1.0	1	2	3	4	5	1
1.1 to 5.0	3	4	6	8	11	2
5.1 to 10.0	4	6	9	11	15	3
10.1 to 20.0	5	8	12	16	22	4
20.1 to 30.0	7	10	15	20	29	5
30.1 to 40.0	8	11	17	22	33	6
40.1 to 50.0	9	12	19	24	36	7

NOTE 1: The distance in the table must be measured from the nearest point on the packages of radioactive materials.

(e) Persons should not remain unnecessarily in a vehicle containing radioactive materials.

(f) Each fissile class III radioactive material shipment (as defined in § 173.455(a)(3) of this subchapter) must be transported in accordance with one of the methods prescribed in § 173.457 of this subchapter. The transport controls must be adequate to assure that no fissile class III shipment is transported in the same transport vehicle with any other fissile radioactive material shipment. In loading and storage areas each fissile class III shipment must be segregated by a distance of at least 20 feet from other packages required to bear one of the "Radioactive" labels described in § 172.403 of this subchapter.

(g) For shipments transported under exclusive use conditions the radiation dose rate must not exceed 2 millirem per hour in any position normally occupied in the motor vehicle. For shipments transported as exclusive use under the provisions of § 173.441(b) for packages with external radiation levels in excess of 200 millirem per hour at the package surface, the motor vehicle must meet the requirements of a closed transport vehicle (§ 173.403 of this subchapter).

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 177-3, 33 FR 14933, Oct. 4, 1968; Amdt. 177-3, 33 FR 19823, Dec. 27, 1968]

EDITORIAL NOTE: For Federal Register citations affecting § 177.842, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 177.843 Contamination of vehicles.

(a) Each motor vehicle used for transporting radioactive materials under exclusive use conditions in accordance with § 173.425(c) or § 173.443(c) shall be surveyed with radiation detection instruments afer each use. A vehicle may not be returned to service until the radiation dose rate at each accessible surface is 0.5 millirem per hour or less and the removable (non-fixed) radioactive surface contamination is not greater than the level prescribed in § 173.443(a).

(b) This section does not apply to any vehicle used solely for transporting radioactive material if a survey of the interior surface shows that the radiation dose rate does not exceed 10 millirem per hour at the interior surface or 2 millirem per hour at 3 feet from any interior surface. These vehicles must be stenciled with the words "For Radioactive Materials Use Only" in lettering at least 3 inches high in a conspicuous place, on both sides of the exterior of the vehicle. These vehicles must be kept closed at all times other than loading and unloading.

(c) In case of fire, accident, breakage, or unusual delay involving shipments of radioactive material, see § 177.861.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 177-3, 33 FR 14933, Oct. 4, 1968, as amended by Amdt. 177-35, 41 FR 16131, Apr. 15, 1976; Amdt. 177-51, 45 FR 81573, Dec. 11, 1980; Amdt. 177-57, 48 FR 10247, Mar. 10, 1983]

§ 177.844 Other regulated materials.

Asbestos must be loaded, handled, and unloaded, and any asbestos contamination of transport vehicles removed, in a manner that will minimize occupational exposure to airborne asbestos particles released incident to transportation. (See § 173.1090 of this subchapter.)

[Amdt. 177-44, 43 FR 56668, Dec. 4, 1978]

Subpart C—Segregation and Separation Chart of Hazardous Materials

§ 177.848 Segregation and separation chart of hazardous materials.

(a) Charged electric storage batteries must not be loaded in the same vehicle with explosives, class *A*.

(b) Cyanides or cyanide, mixtures must not be loaded or stored with acids or corrosive liquids.

(c) Gas identification sets may be loaded and transported with all articles named in the segregation and separation chart, except those in column c.

(d) Nitric acid, when loaded in the same motor vehicle with other corrosive liquids in carboys, must be separated from the other carboys. A 2 by 6 inch plank set on edge, should be nailed across the motor vehicle floor at least 12 inches from the nitric acid carboys, and the space between the plank and the carboys of nitric acid should be filled with sand, sifted ashes, or other incombustible absorbent material.

(e) Smokeless powder for small arms in quantities not exceeding 100 pounds net weight in one motor vehicle shall be classed as a flammable solid for purposes of transportation when examined for this classification by the Bureau of Explosives and approved by the Director, OHMT.

(f) Hazardous materials must not be loaded, transported, or stored together, except as provided in the following table:

Segregation and Separation Chart of Hazardous Materials

			a	b	c	d	e	f	g	1	2	3	4	5	6	7	7a	8	8a	9	10	11	12	13	14	15
CLASS A EXPLOSIVES	Low explosives or black powder	a																								
	High explosives, propellant explosives or detonating cord	b																								
	Initiating or priming explosives, wet: Diazodinitrophenol; fulminate of mercury; guanyl nitrosamino guanylidene hydrazine; lead azide; lead styphnate; nitro mannite; nitrosoguanidine; pentaerythrite tetranitrate; tetrazene; lead mononitroresorcinate	c	X	X																						
	Detonators, detonating primers	d		[1]X	[1]X																					
	Ammunition for cannon with explosive projectiles, gas projectiles, smoke projectiles, incendiary projectiles, illuminating projectiles; ammunition for small arms with explosive projectiles, incendiary projectiles; rocket ammunition with explosive projectiles, gas projectiles, smoke projectiles, incendiary projectiles, illuminating projectiles; boosters (explosive), bursters (explosive), and supplementary charges (explosive) without detonators. 3/, 4/	e			X	[1]X																				
	Explosive projectiles, bombs, torpedoes, mines, rifle or hand grenades (explosive), jet thrust [illegible] igniters, jet thrust rocket motors, igniters rocket motor 3/	f			X	[1]X																				
	Detonating fuzes, class A, with or without radioactive components	g		X	X		X	X																		
CLASS B EXPLOSIVES	Ammunition for cannon with empty, inert loaded or solid projectiles, or without projectiles, or rocket ammunition with empty projectiles, inert loaded or solid projectiles or without projectiles	1			X																					
	Propellant explosives, jet thrust units (jato), igniters, jet thrust rocket motors, rocket engines (liquid), igniters, rocket motor starter cartridges	2			X																					
	Fireworks, special or railway torpedoes	3	X	X	X	[1]X	X	X	X																	
CLASS C EXPLOSIVES	Small arms ammunition, or cartridges, practice ammunition	4			X																					
	Primers for cannon or small arms, empty cartridge bags—black powder igniters, empty cartridge cases, primed, empty grenades, primed, combination primers or percussion caps, toy caps, explosive cable cutters, explosive rivets	5			X																					
	Percussion fuzes, tracer fuzes or tracers	6			X																					
	Time, combination or detonating fuzes	7			X																					
	Detonators, detonating primers	7a		[1]X	[1]X		[1]X	[1]X				[1]X														
	Safety squibs, fuse lighters, fuse igniters, delay electric igniters, electric squibs, instantaneous fuse or igniter cord	8			X																					
	Detonating cord	8a			X	[1]X			X			X					[1]X									
	Fireworks, common	9	X	X	X	X	X	X	X																	
OTHER HAZARDOUS MATERIALS	Blasting agents, n.o.s. or [illegible]	10			X	[1]X						X					[1]X									
	Flammable liquids or flammable gases; flammable liquid or flammable gas label	11	X	X	X	X	X	X	X																	
	Flammable solids; flammable solid label Oxidizer; oxidizer label Organic peroxide; organic peroxide label	12	X	[5]X	X	[5]X	X	X	X																	
	Corrosive liquids; corrosive label	13	X	X	X	X	[2]X	X	X	[2]X	[3]X												[2]X			
	Nonflammable gases; N.F.G. label	14	X	X	X	X	X	X	X																	
	Poisonous gases or liquids in tank car tanks, cylinders, projectiles or bombs; poison gas labels	15	X	X	X	X	X	X	X	X	X	X								X		X	X	X		
	Radioactive materials; radioactive label	16	[6]X	[6]X	[6]X	[6]X	[6]X	[6]X	[6]X																	

Instructions

The letter X at an intersection shows that these materials must not be loaded or stored together. Example: Detonating fuzes, class A, with or without radioactive components, (g) must not be loaded or stored with high explosives or propellant explosives (b).

Footnotes

1. Except as prescribed in §177.81(a) or 177.835(g) loading and transportation of detonators or detonating primers with materials marked in rows b, c, e, f, 3, 8a or 10 is prohibited.

2. Corrosive liquids must not be loaded above or adjacent to flammable solids, oxidizing materials, ammunition for cannon with or without projectiles, or propellant explosives, except that shippers loading truckload shipments of corrosive liquids and flammable solids or oxidizing materials packaged and who have obtained prior approval from the Department may load such materials together when it is known that the mixture of contents would not cause a dangerous evolution of heat or gas.

3. Explosives, class A, and explosives, class B must not be loaded or stored with chemical ammunition containing incendiary charges or white phosphorus either with or without bursting charges.

4. Boosters (explosive), bursters (explosive), or supplementary charges (explosive) without detonators when shipped by, to, or for the Departments of the Army, Navy, and Air Force of the United States Government may be loaded with any of the articles named (except items) in columns c, d, 2, 8, 11, 12, 13, 14, 15 and 16.

5. Does not include ammonium nitrate, fertilizer grade, which may be loaded, transported or stored with high explosives or with detonators containing no more than 1 gram of explosive each, excluding ignition and delay charges.

6. Normal uranium, depleted uranium, and thorium metal in solid form may also be loaded and transported with articles named in columns a, b, c, d, e, f and g.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, App. A to Part 1)

[Amdt. 177-62, 49 FR 7368, Feb. 29, 1984; 49 FR 9189, Mar. 12, 1984, as amended by Amdt. 177-64, 50 FR 810, Jan. 7, 1985; Amdt. 177-67, 49 FR 41523, Oct. 11, 1985]

Subpart D—Vehicles and Shipments in Transit; Accidents

§ 177.853 Transportation and delivery of shipments.

(a) *No unnecessary delay in movement of shipments.* All shipments of hazardous materials shall be transported without unnecessary delay, from and including the time of commencement of the loading of the cargo until its final discharge at destination.

(b) *Delivery at destination.* Shipments of hazardous materials which are refused by the consignees, or which can not be delivered within 48 hours after arrival at destination, must be promptly disposed of (1) by return to the shipper, if in proper shipping condition, or (2) by storage, provided a suitable storage place for such articles is available, or (3) by sale, or (4) when necessary to safety, by destruction: *Provided,* That charged electric batteries may be held for 30 days after arrival at destination, pending delivery or disposition.

(c) *Delivery to authorized person, or magazine.* Every shipment of dangerous explosives by motor vehicle shall be delivered only to someone authorized to receive it, except such explosives shipments as are placed in magazines which are immediately thereafter locked.

[29 FR 18795, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

§ 177.854 Disabled vehicles and broken or leaking packages; repairs.

(See also Forbidden articles, § 177.821).

(a) *Care of lading, hazardous materials.* Whenever for any cause other than necessary traffic stops any motor vehicle transporting any hazardous material is stopped upon the traveled portion of any highway or shoulder thereof, special care shall be taken to guard the vehicle and its load or to take such steps as may be necessary to provide against hazard. Special effort shall be made to remove the motor vehicle to a place where the hazards of the materials being transported may be provided against. See §§ 392.22, 392.24, and 392.25 of this title for warning devices required to be displayed on the highway.

(b) *Disposition of containers found broken or leaking in transit.* When leaks occur in packages or containers during the course of transportation, subsequent to initial loading, disposition of such package or container shall be made by the safest practical means afforded under paragraphs (c), (d), and (e) of this section.

(c) *Repairing or overpacking packages.* (1) Packages may be repaired when safe and practicable, such repairing to be in accordance with the best and safest practice known and available.

(2) Packages of hazardous materials that are damaged or found leaking during transportation, and hazardous materials that have spilled or leaked during transportation, may be forwarded to destination or returned to the shipper in a salvage drum in accordance with the requirements of § 173.3(c) of this subchapter.

(d) *Transportation of repaired packages.* Any package repaired in accordance with the requirements of paragraph (c)(1) of this section, except as provided in §§ 177.855(c), 177.856(c), and 177.858(b), may be transported to the nearest place at which it may safely be disposed of only in compliance with the following requirements:

(1) The package must be safe for transportation.

(2) The repair of the package must be adequate to prevent contamination of or hazardous admixture with other lading transported on the same motor vehicle therewith.

(3) If the carrier is not himself the shipper, the consignee's name and address must be plainly marked on the repaired package.

(e) *Disposition of unsafe broken packages.* In the event any leaking package or container cannot be safely and adequately repaired for transportation or transported, it shall be stored pending proper disposition in the safest and most expeditious manner possible.

(f) *Stopped vehicles; other dangerous articles.* Whenever any motor vehicle transporting flammable liquids, flammable solids, oxidizing materials, corrosive materials, compressed gases, or poisons, is stopped for any cause other than necessary traffic stops upon the traveled portion of any highway, or a shoulder next thereto, the following requirements shall be complied with during the period of such stop:

(1) For motor vehicles other than cargo tank motor vehicles used for the transportation of flammable liquids or flammable compressed gases and not transporting explosives, Class A, or Class B, warning devices must be set out in the manner prescribed by § 392.22 of this title.

(2) For cargo tank motor vehicles used for the transportation of flammable liquids or flammable compressed gases, whether loaded or empty, and vehicles transporting explosives Class A or Class B, warning devices must be set out in the manner prescribed by § 392.25 of this title.

(g) *Repair and maintenance of vehicles containing certain hazardous materials*—(1) *General.* No person may use heat, flame or spark producing devices to repair or maintain the cargo or fuel containment system of a motor vehicle required to be placarded, other than COMBUSTIBLE, in accordance with Subpart F of Part 172 of this subchapter. As used in this section, "containment system" includes all vehicle components intended physically to contain cargo or fuel during loading or filling, transport, or unloading.

(2) *Repair and maintenance inside a building.* No person may perform repair or maintenance on a motor vehicle subject to paragraph (g)(1) of this section inside a building unless:

(i) The motor vehicle's cargo and fuel containment systems are closed (except as necessary to maintain or repair the vehicle's motor) and do not show any indication of leakage;

(ii) A means is provided, and a person capable to operate the motor vehicle is available, to immediately remove the motor vehicle if necessary in an emergency;

(iii) The motor vehicle is removed from the enclosed area upon completion of repair or maintenance work; and

(iv) For motor vehicles loaded with explosives A or B, flammable liquids or flammable gases, all sources of spark, flame or glowing heat within the area of enclosure (including any heating system drawing air therefrom) are extinguished, made inoperable or rendered explosion-proof by a suitable method. *Exception:* Electrical equipment on the vehicle, necessary to accomplish the maintenance function, may remain operational.

(h) *No repair with flame unless gas-free.* No repair of a cargo tank used for the transportation of any flammable liquid or poisonous liquid, or any compartment thereof, or of any container for fuel of whatever nature, may be repaired by any method employing a flame, arc, or other means of welding, unless the tank or compartment shall first have been made gas-free.

[29 FR 18795, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

Editorial Note: For Federal Register citations affecting § 177.854, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 177.855 Accidents; explosives.

(a) *Vehicle disabled; warning of nearby persons; removal of explosives.* In the event of an accident involving any motor vehicle transporting any explosives, every available means shall be employed to prevent individuals, other than those employed in the protection of persons or property or in the removal of hazards or wreckage, from congregating in the vicinity; such means shall also be employed to prevent smoking, to keep flame away, and to safeguard against the aggravation of the hazard present, and to warn other users of the highway. In the event that any motor vehicle laden with or carrying dangerous explosives is entangled with another or with any other object or structure, following an accident, no attempt shall be made to disentangle either vehicle, or the laden vehicle from the object or structure, until the lading, together with any fragments thereof, be removed to a place at least 200 feet from the vehicle (and preferably 200 feet from any habitation). In the event of fire, involving a motor vehicle laden with any explosive every practicable effort shall be made to give warning of danger of explosion to habitants in the vicinity and to other users of the highway.

(b) *Disposition of spilled or leaking explosives.* In the event of any accident involving any motor vehicle transporting any explosive in which packages are broken, all unbroken packages and as much of any broken packages as possible shall be carefully gathered and removed to a place of safety, in order to prevent fire or explosion. In clearing any wreck in which a motor vehicle containing any explosive is involved, care shall be exercised not to produce sparks with tools or by other means in moving of or working about the wreckage, so as to avoid as far as possible fires or explosions.

(c) *Explosives packages in transit capable of repair.* Any package of explosives found injured or broken in transit may be repaired or recoopered when this is evidently practicable and not dangerous. When a box that contains any explosive is so damaged that it cannot be repaired it should be reinforced by stout wrapping paper and twine, placed in another strong box, and surrounded by dry, fine sawdust, or dry and clean cotton waste, or elastic wads made from dry newspapers. The box cover should then be securely attached. A ruptured can or keg should be inclosed in a grain bag of good quality, and boxed. Injured packages thus protected, and properly marked with name of contents and consignee's name and address, may be carried to destination: *Provided, however,* That the motor carrier, if himself the shipper, need not mark his own name and address on the package.

(d) *Liquid nitroglycerin, desensitized liquid nitroglycerin or diethylene glycol dinitrate.* When any liquid nitroglycerin, desensitized liquid nitroglycerin or diethylene glycol dinitrate has been spilled on any portion of any motor vehicle it shall be washed with a suitable neutralizing agent until all of any such spillage shall have become completely neutralized.

NOTE 1: Liquid nitroglycerin, desensitized liquid nitroglycerin or diethylene glycol dinitrate may be destroyed by use of a solution composed of:

60 percent commercial sodium sulfide.	1 ounce.
Denatured alcohol	7½ fluid ounces.
Acetone	2 fluid ounces.
Water	3 fluid ounces.

(e) *Explosives other than liquid nitroglycerin, desensitized liquid nitroglycerin or diethylene glycol dinitrate.* When particles of any explosive composition other than liquid nitroglycerin, desensitized liquid nitroglycerin or diethylene glycol dinitrate have escaped from a damaged container to the floor of the body of the carrier's motor vehicle the floor shall be thoroughly swept and any absorbed portion removed.

(f) *Unrepairable explosives packages.* When any package of explosives in transit is found to be leaking or damaged and cannot be recoopered, it may not be transported beyond the minimum distance necessary to reach a place where the explosive may be disposed of with safety, except as provided in § 177.854(e) and paragraph (c) of this section.

[29 FR 18795, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 15, 1967]

§ 177.856 Accidents; flammable liquids.

(a) *Accident to vehicle; warnings; no sparks or flame.* In the event of an accident involving any motor vehicle transporting any flammable liquid every available means shall be employed to prevent individuals, other than those employed in the protection of persons or property or in the removal of hazards or wreckage, from congregating in the vicinity; such means shall also be employed to prevent smoking, to keep fires or flame away, to safeguard against the hazard present, and to warn other users of the highway. (See also § 177.807.)

(b) *Prevent leakage from spreading.* Whenever any flammable liquid is escaping from a container, all practical means shall be taken to prevent such liquid from spreading over a wide area, from flowing into sewers and streams, and from becoming ignited.

(c) *Disposition of contents of cargo tank when unsafe to continue.* In the event of a leak in a cargo tank of such a character as to make further transportation unsafe, the leaking vehicle should be removed from the traveled portion of the highway; and every available means employed for the safe disposal of the leaking liquid by preventing, so far as practicable, its spread over a wide area, such as by digging trenches to drain to a hole or depression in the ground, diverting the liquid away from streams or sewers if possible, or catching the liquid in containers if practicable. Smoking and the lighting of cigarettes, cigars, or pipes in the vicinity is prohibited, and fires or flames in the vicinity of the leaking cargo tank must be extinguished.

(d) *Transfer of flammable liquids en route.* No flammable liquid shall be transferred from one container to another, or from one motor vehicle to another vehicle, or from another vehicle to a motor vehicle, on any public highway, street, or road, except in case of emergency. In such cases warning devices must be set out in the manner prescribed by § 392.25 of this title. In any event, all practicable means, in addition to those hereinbefore prescribed, shall be taken to protect and warn other users of the highway against the hazard involved in any such transfer, or against the hazard occasioned by the emergency making such transfer necessary. Nothing contained in this rule shall be so construed as to prohibit the fueling of machinery or vehicles used in road construction and maintenance.

(e) *Transportation of leaking cargo tanks.* A leaking cargo tank may only be transported the minimum distance necessary to reach a place where the contents of the tank or compartment may be disposed of with safety. Every available means must be utilized to prevent the leakage or spillage of the liquid upon the highway.

[29 FR 18795, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 177.856, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 177.857 Accidents; flammable solids and oxidizing materials.

(a) *Dangerous articles spilled; warning of nearby persons.* In the event of any accident involving any motor vehicle in which any flammable solid or oxidizing material may have become spilled, every practicable and available means shall be taken to warn all approaching persons of the hazard of fire.

(b) *Prevent spread of fire where possible.* Care shall be exercised in the event of damage to packages of flammable solids or oxidizing materials which either have been or may be on fire to limit the spread of the fire.

(c) *Disposition of spilled or leaking materials.* In the event of any accident involving any motor vehicle transporting any flammable solid or oxidizing material in which packages are broken, as much as possible of any broken packages shall be carefully gathered and removed to a place of safety, and if the removal of unbroken packages from the motor vehicle would decrease the hazard of fire or other hazard, they shall be removed. The handling of any such materials not contained in packages shall be such as to promote the greatest safety to other users of the highway.

(d) *Reloading of damaged packages of matches; repairs.* In the event of damage to matches or packages of matches by fire or by water in extinguishing a fire in transit, they shall be reloaded in accordance with the applicable requirements for the packing and loading of matches. Great care shall be taken, however, first to examine and repair any damage to outside containers before reloading, and all loose matches shall be destroyed. Smoking boxes of matches shall not be opened in the vicinity of the remainder of the lading. Such boxes shall be destroyed at a safe distance from the motor vehicle, preferably by burning, and shall not be left, either smoking or burning.

(e) *Calcium hypochlorite compounds, dry, involved in fires.* Calcium hypochlorite compounds, dry, packed in metal drums when involved in motor vehicles where fire has occurred from any cause must be held at least five days before forwarding. Drums showing evidence of spontaneous heating or stress from internal pressure must not be reshipped.

[29 FR 18795, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

§ 177.858 Accidents; corrosive materials.

(a) *Accident to vehicle; other lading damaged; vehicle washed.* In the event of any accident involving any motor vehicle transporting corrosive materials in which has been involved the breakage, spillage, or leakage of containers of such materials, care shall be exercised in the handling of any other lading which may have become damaged thereby so as to minimize the hazard in handling such damaged lading during the unloading process. The interior or any other parts of the motor vehicle upon which a corrosive liquid may have become spilled shall be thoroughly washed with water as soon after the unloading process as feasible and prior, in any event, to the subsequent reloading of the motor vehicle. (See also § 177.807.)

(b) *Leaking cargo tanks.* In the event of leakage of liquid from any cargo tank or any compartment thereof used for the transportation of corrosive liquids, which develops or is discovered subsequent to the commencement of transportation, any one of the following means, or any means in addition to those herein prescribed, equally or more effective, shall be employed to minimize further hazard:

(1) Further to transport the cargo tank only the minimum distance to reach a place where the contents of the tank or compartment which is leaking may be disposed of with safety, meanwhile employing every available means to prevent the spillage or leaking of any liquid on the highway.

(2) In the event the leak is of such a character as to make further transportation of the cargo tank unsafe, to draw off the traveled portion of the highway, and to employ every available means for the safe disposal of the leaking liquid by preventing, so far as practicable, its spread over a wide area, as by absorbing by means of the use of noncombustible absorbent material, such as fine ashes, sand, earth, etc., or by any other practicable means; by digging trenches to drain to a hole or depression in the ground; by diverting the liquid away from streams or sewers if possible; or by catching the liquid in containers if practicable. So far as practicable, every available means shall be employed to prevent the congregation of spectators and to prevent them from coming in contact with the liquid or its fumes. All available means shall be taken to prevent injury or damage to other users of the highway, or to livestock or farm animals, which might be occasioned by the unloading of the corrosive liquid.

[29 FR 18795, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 177-21, 37 FR 5950, Mar. 23, 1972; Amdt. 177-27, 38 FR 23792, Sept. 4, 1973]

§ 177.859 Accidents; compressed gases.

(a) *Accident to vehicle; warnings; keep fire away.* In the event of an accident involving any motor vehicle transporting any compressed gas, the release of which would constitute a hazard to other users of the highway, due care shall be taken that only persons employed in the removal of hazards or wreckage shall be allowed in proximity to the motor vehicle, and the shipper should be notified. In such cases, every practicable and available means shall be taken to warn all approaching persons of the danger involved and to caution them against the use of matches or flame-producing devices, if the gas is flammable.

(b) *Transfer of flammable gas en route; no flame or sparks.* No flammable compressed gas shall be transferred from one container to another, or from one tank motor vehicle to another tank vehicle, or from another tank vehicle to a tank motor vehicle, on any public highway, street, or road, except in case of emergency. In such cases every precaution shall be taken to prevent the escape of gas. Warning devices must be set out in the manner prescribed in § 392.25 of this title. All cargo tanks involved in such transfer shall be grounded. The transfer shall be made only during daylight, unless the emergency occurs at night or extends into hours of darkness and the hazard would be increased by waiting until daylight. In any such event, all practicable means, in addition to those hereinbefore prescribed, shall be taken to protect and warn other users of the highway against the hazard involved in any such transfer, or against the hazard occasioned by the emergency making such transfer necessary. Every precaution shall be taken to prevent the ignition of any flammable compressed gas from any source; and when it is possible to prevent the congregation of persons not directly concerned with the emergency, this shall be done. Every practicable precaution shall be taken to keep flames or fire away from the scene of the emergency and to prevent smoking or the lighting of pipes, cigars, or cigarettes. Similarly, special care shall be exercised in the operation of any engine, whether of the motor vehicles involved or any other, and where the operation of any such engine would be likely to produce ignition of the flammable compressed gas, the transfer shall be accomplished by other means, if possible. Nothing contained in this section shall be so construed as to prohibit the fueling of machinery or vehicles used in road construction and maintenance.

[29 FR 18795, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 177-17, 36 FR 18469, Sept. 15, 1971; Amdt. 177-31, 39 FR 41743, Dec. 2, 1974]

§ 177.860 Accidents or leakage; poisons.

(a) *Accident to vehicle; warnings; no sparks or flame.* In the event of an accident involving any motor vehicle transporting any poison which is flammable, noxious, or toxic, every available means shall be employed in the protection of persons or property or in the removal of hazards or wreckage, from congregating in the vicinity; such means shall also be employed to prevent smoking, to keep flame away, to safeguard against the aggravation of the hazard present, and to warn other users of the highway. Care shall also be taken to prevent any poison, whether flammable or nonflammable, from contaminating streams or flowing or being spilled into sewers, and poison in powdered form from being scattered by wind. (See also § 177.807.)

(1) *Leakage.* A vehicle which has been used to transport material marked as or known to be poison (class A or B) must be inspected for contamination before reuse. A vehicle which has been contaminated must not be returned to service until such contamination has been removed. This paragraph does not apply to vehicles used solely for transporting such poisons so long as they are used in that service.

(b) *Leaking cargo tanks.* In the event of leakage of liquid from any cargo tank or any compartment thereof used for the transportation of any poison which is also flammable, or which would come also within the definition of a flammable liquid, or of any gas or combination of gas and liquid, or any poison which would come within the definition of a compressed gas, the requirements shall be the same as those set forth for flammable liquids and compressed gases. In addition, all possible care shall be taken to warn bystanders or other users of the highway against the hazard of inhaling vapors or coming in contact with the poison.

[29 FR 18795, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

Editorial Note: For Federal Register citations affecting § 177.860, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

§ 177.861 Accidents; radioactive materials.

(a) In addition to the incident reporting requirements of §§ 171.15 and 171.16 of this subchapter, the carrier must also notify the shipper at the earliest practicable moment following any incident in which there has been breakage, spillage, or suspected radioactive contamination involving radioactive materials shipments. Vehicles, buildings areas, or equipment in which radioactive materials have been spilled may not be again placed in service or routinely occupied until the radiation dose rate at any accessible surface is less than 0.5 millirem per hour and there is no significant removable radioactive surface contamination (see § 173.443 of this subchapter).

Note 1: In these instances, the package or materials should be segregated as far as practicable from personnel contact. If radiological advice or assistance is needed, the U.S. Department of Energy should also be notified. In case of obvious leakage, or if it appears likely that the inside container may have been damaged, care should be taken to avoid inhalation, ingestion, or contact with the radioactive material. Any loose radioactive material should be left in a segregated area and held pending disposal instructions from qualified persons.

NOTE 2: Details involving the handling of radioactive materials in the event of an accident can be found in Bureau of Explosives' Pamphlets 1 and 2.

(b) *Cleaning vehicles.* See § 177.843.

[Amdt. 177-3, 33 FR 14934, Oct. 4, 1968]

EDITORIAL NOTE: For Federal Register citations affecting § 177.861, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

Subpart E—Regulations Applying to Hazardous Material on Motor Vehicles Carrying Passengers for Hire

§ 177.870 Regulations for passenger carrying vehicles.

(a) *Vehicles transporting passengers and property.* In addition to the regulations in Parts 170-189 of this subchapter the following requirements shall apply to vehicles transporting passengers and property.

(b) *No explosives or other hazardous materials on passenger-carrying vehicles, exceptions.* No hazardous materials except small-arms ammunition, emergency shipments of drugs, chemicals and hospital supplies, and the accompanying munitions of war of the Departments of the Army, Navy, and Air Force of the United States Government, are authorized by Parts 170-189 of this subchapter to be transported on motor vehicles carrying passengers for hire where other practicable means of transportation is available

(c) *Explosives in passenger-carrying space forbidden.* No explosive, except small-arms ammunition, may be carried in the passenger-carrying space of any motor vehicle transporting passengers for hire.

(d) *Hazardous materials on passenger carrying vehicles; quantity.* Where no other practicable means of transportation is available the following articles in the quantities as shown may be transported in motor vehicles carrying passengers for hire in a space other than that provided for passengers: Not to exceed 100 pounds gross weight of any or all of the kinds of explosives permitted to be transported by passenger-carrying aircraft or rail car may be transported on a motor vehicle transporting passengers: *Provided, however,* That samples of explosives for laboratory examination, not to exceed two samples, or a total of no more than 100 detonators, Class C explosives at one time in a single motor vehicle, may be transported in a motor vehicle transporting passengers.

(e) *Articles other than explosives on passenger-carrying vehicles.* The gross weight of any given class of hazardous material other than explosives shall not exceed 100 pounds, and the aggregate weight of all such other dangerous articles shall not exceed 500 pounds. This provision does not apply to nontoxic, nonflammable refrigerants, when such refrigerant is for servicing operations of a motor carrier on whose motor vehicles the refrigerant is used. A cylinder secured against movement while in transit and not exceeding 250 pounds gross weight may be transported.

(f) *Poisons on passenger-carrying vehicles.* No motor carrier may transport any extremely dangerous poison, class A, any tear gas or irritating substance, class C, any less dangerous poison, class B, which is a liquid, or any paranitraniline, in any amount, in or on any bus while engaged in the transportation of passengers; or any less dangerous poison, class B, which is other than a liquid, in any amount exceeding an aggregate of 100 pounds gross weight in or on any such bus.

(g) *Radioactive materials.* In addition to the limitations prescribed in paragraphs (b) and (e) of this section, no person may transport any radioactive material requiring labels under §§ 172.436, 172.438, and 172.440 of this subchapter in or on any motor vehicle carrying passengers for hire except where no other practicable means of transportation is available. Packages of radioactive materials must be stored only in the trunk or baggage compartment of the vehicle, and must not be stored in any compartment occupied by persons. Packages of radioactive materials must be handled and placed in the vehicle as prescribed in § 177.842.

[29 FR 18795, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967]

EDITORIAL NOTE: For Federal Register citations affecting § 177.870 see the List of CFR

Sections Affected appearing in the Finding Aids section of this volume.

APPENDIX A—RELATIONSHIP BETWEEN ROUTING REQUIREMENTS IN PART 177 WITH STATE AND LOCAL REQUIREMENTS

I. *Purpose.* This appendix is a statement of the Department of Transportation policy regarding the relationship of State and local rules with Federal rules in Part 177 of this subchapter for routing motor carriers transporting radioactive materials. The purpose of this appendix is to advise a State or local government how it can exercise authority over motor carriers under its own laws in a manner that the Department of Transportation considers to be consistent with rules in Part 177 (see 49 U.S.C. 1811(a)). This appendix and Part 177 do not delegate Federal authority to regulate motor carriers.

II. *Definition.* "Routing rule" means any action which effectively redirects or otherwise significantly restricts or delays the movement by public highway of motor vehicles containing hazardous materials, and which applies because of the hazardous nature of the cargo. Permits, fees and similar requirements are included if they have such effects. Traffic controls are not included if they are not based on the nature of the cargo, such as truck routes based on vehicles weight or size, nor are emergency measures.

III. *Highway route controlled quantity radioactive materials.* A. *State routing rules.* A State routing rule which applies to highway route controlled quantity radioactive materials is inconsistent with Part 177 if:

1. It prohibits transportation of highway route controlled quantity radioactive materials by highway between any two points without providing an alternate route for the duration of the prohibition; or

2. It does not meet all of the following criteria:

(a) The rule is established by a State routing agency as defined in § 171.8 of this subchapter;

(b) The rule is based on a comparative radiological risk assessment process at least as sensitive as that outlined in the "DOT Guidelines";

(c) The rule is based on evaluation of radiological risk wherever it may occur, and on a solicitation and substantive consideration of views from each affected jurisdiction, including local jurisdictions and other States; and

(d) The rule ensures reasonable continuity of routes between jurisdictions.

B. *Local routing rules.* A local routing rule that applies to highway route controlled quantity radioactive materials is inconsistent with this Part if it prohibits or otherwise affects transportation on routes or at locations either:

1. Authorized by Part 177, or

2. Authorized by a State routing agency in a manner consistent with Part 177.

IV. *Quantities of radioactive materials required to be placarded.* A State or local routing rule that applies to a radioactive material (other than a highway route controlled quantity radioactive material), for which Part 177 requires placarding, is inconsistent with Part 177 unless it is identical to § 177.825(a) of this part.

V. *Radioactive materials for which placarding is not required.* A State or local routing rule that applies to a radioactive material for which Part 172 does not require placarding is inconsistent with this part.

VI. *Other related State and local rules.* A State or local transportation rule is inconsistent with Part 177 if it:

A. Conflicts with physical security requirements which the Nuclear Regulatory Commission has established in 10 CFR Part 73 or requirements approved by the Department of Transportation under § 173.22(c) of this subchapter;

B. Requires additional or special personnel, equipment, or escort;

C. Requires additional or different shipping paper entries, placards, or other hazard warning devices;

D. Requires filing route plans or other documents containing information that is specific to individual shipments;

E. Requires prenotification;

F. Requires accident or incident reporting other than as immediately necessary for emergency assistance; or

G. Unnecessarily delays transportation.

(49 U.S.C. 1803, 1804, 1808, 49 CFR 1.53, App. A to Part 1)

[Amdt. 177-52, 46 FR 5317, Jan. 19, 1981, as amended by Amdt. 177-57, 48 FR 10247, Mar. 10, 1983; Amdt. 177-58, 48 FR 17094, Apr. 21, 1983]

Item 4 [illegible]

FINDING AIDS

A list of CFR titles, subtitles, chapters, subchapters and parts and an alphabetical list of agencies publishing in the CFR are included in the CFR Index and Finding Aids volume to the Code of Federal Regulations which is published separately and revised annually.

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Material Approved for Incorporation by Reference

The Director of the Federal Register has approved under 5 U.S.C. 552(a) and 1 CFR Part 51 the incorporation by reference of the following publications. For more information on incorporation by reference, see the preliminary pages of this volume.

49 CFR CHAPTER I (PARTS 100–177)
RESEARCH AND SPECIAL PROGRAMS ADMINISTRATION, DEPARTMENT OF TRANSPORTATION (HAZARDOUS MATERIALS REGULATIONS)

	49 CFR
The Aluminum Association	
420 Lexington Ave., New York, NY 10017	
Aluminum Standards and Data, 1970–71 Dated December 1969	173.286
Aluminum Standards and Data, Sixth Ed., 1979	171.7
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1430 Broadway, New York, NY 10018	
ANSI N14.1–71 Packaging of Uranium Hexafluoride for Transport	171.7; 173.396
American Society of Mechanical Engineers	
United Engineering Ctr., 345 47th St., New York, NY 10017	
ASME Code:	
Sec. VIII (Div. I) and IX of 1977 Ed. of American Society of Mechanical Engineers Boiler and Pressure Code and Addenda through Dec. 31, 1978.	171.7; 173.32; 173.33; 173.306, 173.315, 177.814
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1916 Race St., Philadelphia, PA 19103	
Noncurrent ASTM standards are available from: Engineering Societies Library, 345 E. 47th St., New York, NY 10017.	
ASTM A 20–81 is titled "Standard Specification for General Requirements for Steel Plates for Pressure Vessels," revision C, 1982.	171.7
ASTM A 240–82 is titled, "Standard Specification for Heat-Resisting Chromium and Chromium-Nickel Stainless Steel Plate, Sheet and Strip for Fusion-Welded Unfired Pressure Vessels," revision A.	171.7
ASTM A 242–81 "Standard Specification for High-Strength Low-Alloy Structural Steel," 1982.	171.7
ASTM A 265–69 Nickel and Nickel-Base Alloy Clad Steel Plate	173.252
ASTM A 285–78 Pressure Vessel Plates, Carbon Steel, Low- and Intermediate-Tensile Strength.	172.300
ASTM A 370–77 is titled, "Standard Methods and Definition for Mechanical Testing of Steel Products," 1982.	171.7
ASTM A 441–81 "Standard Specification for High-Strength Low-Alloy Structural Manganese Vandium Steel".	171.7
ASTM A 514–81 "Standard Specification for High-Yield-Strength, Quenched and Tempered Alloy Steel Plate, Suitable for Welding".	171.7
ASTM A 515–69 Carbon Steel Plates for Pressure Vessels for Intermediate and Higher Temperature Service.	174.300

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	49 CFR
ASTM A 516-79b is titled, "Standard Specification for Pressure Vessel Plates, Carbon Steel, for Moderate- and Lower-Temperature Service," 1982.	171.7
ASTM A 537-80 is titled "Standard Specification for Pressure Vessel Plates, Heat-Treated, Carbon-Manganese-Silicon Steel," 1982.	171.7
ASTM A 572 "Standard Specification for High-Strength Low Alloy Columbium-Vanadium Steels of Structural Quality," 1982.	171.7
ASTM A 588-81 "Standard Specification for High-Strength Low-Alloy Structural Steel with 50 ksi Minimum Yield Point to 4 in. Thick".	171.7
ASTM A 606-75 "Standard Specification for Steel Sheet and Strip, Hot-Rolled and Cold-Rolled, High-Strength, Low-Alloy, with Improved Atmospheric Corrosion Resistance," 1975 (reapproved 1981).	171.7
ASTM A 607-75 "Standard Specification for Sheet and Strip, Hot-Rolled and Cold-Rolled, High-Strength, Low-Alloy Columbium and/or Vanadium".	171.7
ASTM A 633-79a "Standard Specification for Normalized High-Strength Low-Alloy Structural Steel".	171.7
ASTM A 715-81 "Standard Specification for Steel Sheet and Strip, Hot-Rolled, High-Strength, Low-Alloy, with Improved Formability".	171.7
ASTM B 162-69 Nickel Plate, Sheet, and Strip	173.252
ASTM B 221-76 Aluminum alloy Extruded Bars, Rods, Shapes, and Tubes.	171.7
ASTM B 557-79 Tension Testing Wrought and Cast Aluminum and Magnesium—Alloy Products.	171.7
ASTM B 580-79 Standard Specification for Anodie Oxide Coatings on Aluminium.	171.7
ASTM C 148-77 Polariscopic Examination of Glass Containers	171.7
ASTM D 56-79 Flash Point by Tag Closed Tester	171.7; 173.115
ASTM D 88-56 (Reapproved 80) Standard Method for Test of Saybolt Viscosity.	171.7, 173.115
ASTM D 93-80 Flash Point by Pensky Martens Closed Tester	171.7, 173.115
ASTM D 323-58, 68 Vapor Pressure of Petroleum Products (Reid Method)	171.7; 173.119; 173.300
ASTM D 1505-68 Density of Plastics by the Density-Gradient Technique.	171.7
ASTM D 1838-64 Copper Strip Corrosion by Liquefied Petroleum (LP) Gases.	173.315
ASTM D 445-65 Viscosity of Transparent and Opaque Liquids (Kinematic and Dyanamic Viscosities).	173.115
ASTM D 1056-68 Testing Sponge and Expanded Cellular Rubber Products.	171.7
ASTM D 2161-79 Conversion of Kinematic Viscosity to Saybolt Universal Viscosity or to Saybolt Furol Viscosity.	171.7, 173.115
ASTM D 3243-73T Flash Point of Aviation Turbine Fuels by Setaflash Closed Tester.	173.115
ASTM D 3278-78 Flash Point of Liquids by Setaflash Closed Tester	171.7, 173.115
ASTM D 445-79 Kinematic Viscosity of Transparent and Opaque Liquids (and Calculation of Dynamic Viscosity).	171.7, 171.8
ASTM D 1200-70 Viscosity of Paints, Varnishes, and Lacquers by Ford Viscosity Cup.	171.8
ASTM E 290-77 Semi-Guided Bend Test for Ductility of Metallic Materials.	171.7

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	49 CFR
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Pamphlet 6a (includes Appendix No. 1, Oct. 1944 and Appendix 2, Dec. 1945) "Illustrating Methods for Loading and Bracing Carload and Less Than Carload Shipments of Loaded Projectiles, Loaded Bombs, Etc." 1943.	171.7; 174.101; 174.290
Pamphlet 6c "Illustrating Methods for Loading and Bracing Trailers and Less-Than-Trailer Shipments of Explosives and Other Dangerous Articles Via Trailer-on-Flatcar (TOFC) or Container-on-Flatcar (CDFC)", Sept. 1968.	171.7; 174.55; 174.63; 174.101; 174.112; 174.115
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CGA Pamphlet C-3 "Standards for Welding and Brazing on Thin Walled Containers," 1975.	171.7
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	49 CFR
CGA Pamphlet C–7 "A Guide for the Preparation of Precautionary Markings for Compressed Gas Containers," Appendix A, May 15, 1971, and Addenda January 1976.	171.7; 172.400
CGA Pamphlet C–8 "Standard for Requalification of DOT–3HT Cylinders," 1972.	171.7; 173.34
CGA Pamphlet C–12 "Qualification Procedure for Acetylene Cylinder Design," 1979.	171.7
CGA Pamphlet C–14 "Procedures for Fire Testing of DOT Cylinder Pressure Relief Device Systems," 1979.	171.7
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420 Lexington Ave., New York, NY 10017	
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172.330 (a) introductory text and (b) amended; (a)(2), (c)(1) and (d) revised	Δ40678
172.400 (a) revised; (b)(1), (2)(iii), and (6) amended; (b)(11) redesignated (c) and amended; new (b)(11) added	Δ40679
172.402 (a) and (i) revised; (f) amended	Δ40679
172.403 (c)(1) revised; (f)(1) removed; (g) added	Δ40679
172.405 Existing text designated (a); (b) added	Δ40679
172.406 (a) and (c) amended; (e)(4) added	Δ40679
172.407 (e) amended	Δ40679
172.426 (a) amended	Δ40679
172.430 (a) amended	Δ40679
172.432 (c) amended	Δ40679
172.500 (b) revised	Δ40679
172.504 (a) and (c)(2) amended; (b) revised	Δ40679
172.506 (a) introductory text amended	Δ40679
172.510 (c) introductory text and (b) amended	Δ40680
172.512 (a) and (c) amended; (a) footnotes 1 and 2 revised; (a) footnote 3 added	Δ40680
172.514 (a) amended	Δ40680
172.519 (d) amended; (e) Note removed; (g) added	Δ40680
172.521 (b) amended	Δ40680
172.525 (a)(2) and (b) amended	Δ40680
172 Appendix B amended	Δ40680

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173 Certain sections; nomenclature changes	Δ16063-16087
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173.1—173.8 (Subpart A) Heading added	Δ40680
173.1 Revised	Δ16062
(c) added; eff. 1-3-77	Δ38180
(c) revised	Δ40476
173.2 Revised	Δ16062
(a) and (b)(4) amended	Δ40680
173.3 Revised	Δ16062
(a) amended	Δ40680
173.4 Removed	Δ16063
173.5 Removed	Δ16063
173.6 Added	Δ16063
173.7 (b) revised	Δ16063
173.9 Removed	Δ16063
173.10 Removed	Δ16063
173.21—173.34 (Subpart B) Heading revised	Δ16063
173.21 (a) and (d) revised	Δ16063
173.22 (a) revised; eff. 1-3-77	Δ38180
(a) revised	Δ40476
(a) amended	Δ40680
173.22a Added	Δ3478
173.24 (c)(1) revised; eff. 1-3-77	Δ38180
173.25 (a)(ii), (b) introductory text, and (b)(3) revised	Δ16063
173.26 (b) revised	Δ16064
173.27 Revised	Δ16064
173.28 (n) redesignated as (o); new (n) added	Δ16064
(i) and (m) amended	Δ40680
173.29 Heading revised; (g) added	Δ16064
(g)(i) and (ii) redesignated as (g)(1) and (2); (f) and (g)(1) amended	Δ40680
173.30 Revised	Δ16064
173.31 (b)(5) added	Δ16064
(a)(3) revised	Δ21476
173.32 Heading and (a)(2) revised; (a)(4) added	Δ16064
173.33 Heading revised; (a)(1) added	Δ16064
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173.34 Heading amended; (d)(3) revised	Δ16064
173.51 (a) revised; (b) through (r) redesignated as (a)(1) through (17)	Δ16064
173.52 (a) introductory text revised	Δ16064
173.54 (b) revised; (c) removed	Δ16064
173.56 (g) revised; (i) removed	Δ16064
173.57 (b) revised; (c) removed	Δ16065
173.58 (c) removed	Δ16065
173.59 (b) removed	Δ16065
173.60 (e)(2) and (f) removed	Δ16065
173.62 (b) removed	Δ16065
173.63 (g) removed	Δ16065
173.64 Heading revised; (c) removed	Δ16065
173.65 (d) introductory text revised; (k) removed	Δ16065
173.66 (d)(1) Note 1, (e)(1) Note 1, and (i) removed	Δ16065
173.67 (c) removed	Δ16065
173.68 (c) removed	Δ16065
173.69 Heading revised; (d) removed	Δ16065
173.70 (a) revised; (e) removed	Δ16065
173.71 (a) revised; (e) removed	Δ16065
173.72 (a) revised; (e) removed	Δ16065
173.73 (a) revised; (e) removed	Δ16065
173.74 (a) revised; (e) removed	Δ16065
173.75 (a) revised; (e) removed	Δ16065
173.76 (a) revised; (d) removed	Δ16065
173.77 (a) revised; (e) removed	Δ16066
173.78 (a) revised; (e) removed	Δ16066
173.79 Heading and (a) introductory text revised; (e) removed	Δ16066
173.80 (a) revised; (f) removed	Δ16066
173.86 Revised	Δ15013
(b)(3), and (e)(2) and (3) amended	Δ27728
173.89 (c) removed	Δ16066
173.90 (c) removed	Δ16066

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173.93 (d)(5) and introductory texts of (a) and (g) revised	Δ16066
173.95 (a) introductory text revised; (e) removed	Δ16066
173.101 (c) and (d) revised	Δ16066
173.103 (b) removed	Δ16066
173.110 (b) revised	Δ16066
173.115 (f) removed	Δ16066
173.116 (a) and (b) revised	Δ16066
173.118 Heading, (a) introductory text, and (b) revised; (d) added; (e) removed	Δ16066
(a) amended	Δ40681
173.118a Added	Δ16067
173.119 (a)(1) and (3), (b)(7), (i), (k)(3), (m)(1), (5), and (8), and introductory text of (a), (b), and (m) revised	Δ16067
173.120 (a) and (c) revised; (d) added	Δ16067
173.121 (b) removed	Δ16067
173.122 (a) introductory text and (a)(3) revised	Δ16067
173.123 (c) added	Δ16068
173.124 (a)(5)(i) and (b) added	Δ16068
173.125 Heading, (a) introductory text, and (a)(7) revised; (a)(3) and (4) removed	Δ16068
173.126 (b) removed	Δ16068
173.128 Heading, (a) introductory text, (a)(2), (3), and (4), and (c) revised; (c)(1) removed	Δ16068
173.129 Heading, (a) introductory text, (a)(2) and (b) revised	Δ16068
173.130 Revised	Δ16068
Amended	Δ40681
173.131 (a)(2) added	598
173.132 Heading, (a) introductory text, (a)(2), (a)(3), and (b) revised	Δ16068
173.133 (a)(1) Note 1 removed	Δ16068
173.135 Heading, (a) introductory text, and (a)(5) revised	Δ16069
173.136 (a)(3) and (a)(4) revised	Δ16069
173.138 (b) removed	Δ16069
173.139 (a)(4)(i) added	Δ16069
173.143 (b) removed	Δ16069

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173.145 Heading and (a)(1) revised.......Δ16069
Heading amended.......Δ40681
173.146 Heading and (b) revised.......Δ16069
173.147 (b) revised.......Δ16069
(b) amended.......Δ40681
173.149a Added.......Δ16069
173.150—173.239a (Subpart E) Heading revised.......Δ16069
173.150 Revised.......Δ16069
Amended.......Δ40681
173.151 Revised.......Δ16069
173.151a Added.......Δ16069
Revised.......Δ40681
173.153 Revised.......Δ16069
(a) and (b) amended.......Δ40681
173.154 Heading and (a) introductory text revised.......Δ16070
Heading and (a) amended.......Δ40681
173.159 Revised.......Δ16070
173.162 (a) introductory text and (a)(9) revised; (a)(11) added; (f)(4) removed.......Δ16070
(a) revised.......Δ40681
173.164 Heading, (a) introductory text and (a)(2) revised.......Δ16070
173.167 (b) removed.......Δ16070
173.169 (b) removed.......Δ16070
173.170 Heading revised; (b) removed.......Δ16070
173.171 (b) removed.......Δ16070
173.172 (b) removed.......Δ16070
173.174 Heading revised; (b) and (d) removed.......Δ16070
173.176 (d) introductory text revised; (e), (e) Note 1, and (g)(1) removed; (h) added.......Δ16070
(g) revised; (h) amended.......Δ40681
173.177 (a) Introductory text and (b) revised; (a)(4) Note removed.......Δ16070
173.178 Revised.......Δ16071
173.179 Removed.......Δ16071
173.180 (b) removed.......Δ16071
Removed.......Δ40681
173.181 Removed.......Δ40681
173.182 (b)(3) removed (a), (b), (b)(1), (2), (4), and (b)(5) through (7) and (c) revised.......Δ16071
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173.186 (a) Note 1 and (b) removed.......Δ16071
173.188 (a)(1) Note 1 removed.......Δ16071
173.190 (a) and (c) introductory text revised; (b)(3) amended; (b)(3)(i) added; (e) removed.......Δ16071
(b)(3) amended.......Δ40681
173.194 (a)(2) revised.......Δ16072
173.195 Heading and (a) introductory text revised; (a)(4) removed.......Δ16072
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173.197 (a) introductory text revised.......Δ16072
173.199 (b) removed.......Δ16072
173.200 (b) removed.......Δ16072
173.204 (a)(4) revised; (a)(8) Note 1 removed.......Δ16072
173.206 Heading, (a) introductory text, (a)(2), (d), and (e) revised.......Δ16072
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173.209 (b) removed.......Δ16072
173.210 (b) removed.......Δ16072
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173.213 (b) removed.......Δ16072
173.217 Heading, (a) introductory text, and (b) revised.......Δ16072
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173.220 (a)(2) and (b)(1) revised.......Δ16073
(a)(2) and (b)(1) amended.......Δ40681
173.223 (b) revised.......Δ16073
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173.225 Heading and (a) introductory text revised.......Δ16073
(a) amended.......Δ40681
173.226 (b) introductory text revised.......Δ16073
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173.229 (b) introductory text revised.......Δ16073
(b) amended.......Δ40681
173.232 Revised.......Δ16073
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173.237 Revised.......Δ16073

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173.240 Heading, (a)(1) and (a)(2) revised..........Δ16074
173.241 (a) introductory text, (a)(1) and (a)(2) revised..........Δ16074
173.242 (c) revised..........Δ16074
173.244 Heading, (a) and (b) revised..........Δ16074
(a) amended..........Δ40682
173.245 (a) (1), (3), (17), (19) through (22), and (b) revised..........Δ16074
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173.247 Heading, (a)(3) and (a)(16) revised..........Δ16075
173.248 (a) introductory text and (a)(1) revised..........Δ16075
173.249 Heading, (a)(3), (b) introductory text, (b)(1), and (c) revised; (a)(9) removed; (d) added..........Δ16075
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173.250 (a) revised..........Δ16075
(a) amended..........Δ40682
173.252 (a)(3)(ii) added; (g)(2) and (3) revised..........Δ16075
173.253 (a)(4) removed..........Δ16075
173.256 (a)(4) revised..........Δ16076
173.257 Heading, (a) introductory text, and (a) (8) and (12) revised..........Δ16076
173.258 (a)(3) revised..........Δ16076
173.260 (e)(1) and (2) removed; (e) (2)(i), (ii), (iii), and (iv) redesignated as (e)(1), (2), (3), and (4); (d), (e), and (f) revised..........Δ16076
(e) amended..........Δ40682
173.261 (b) introductory text revised..........Δ16076
(b) amended..........Δ40682
173.262 (a) (1) and (8) revised..........Δ16076
173.263 Heading, (a)(9) Note 1 removed; (a)(5), (7), (14), (18), (23), (24), and (b)(2) revised..........Δ16076
(b)(2) amended..........Δ40682
173.264 (a)(7) Note 4 and (b)(5) removed; (a)(8) Note 1 redesignated as (a)(8)(i); (a)(8)(ii) and (b)(2)(i) added; (a)(10) Note 3, (a)(8) and (b)(6) revised..........Δ16077

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(a)(8) amended..........Δ40682
173.265 (a)(4), (c)(1), and (d)(4) revised..........Δ16077
173.266 (f)(1)(i) added; (b), (c), and (d) introductory texts and (c)(1) and (3) revised..........Δ16077
(b)(1) through (8) added; (c)(1) amended..........Δ40682
173.267 (c) introductory text and (c)(4) revised..........Δ16077
173.268 (a)(1) added; (i) and (j) introductory texts and (b)(4) revised..........Δ16077
173.269 (a)(2) revised..........Δ16078
173.272 (b) and (i)(10), (11), (15), and (16) revised..........Δ16078
(b) amended..........Δ40682
173.273 (a)(4)(i) added..........Δ16078
173.276 (a)(1) revised..........Δ16078
173.277 (a)(2) and (5), (e) and (d) introductory text revised; (f) and (g) added..........Δ16078
(d) and (e) amended..........Δ40682
173.278 (b)(2) revised..........Δ16078
173.279 (b) revised..........Δ16078
(b) amended..........Δ40683
173.280 Heading, (a) introductory text and (a)(5) revised..........Δ16079
173.286 (b) introductory text revised..........Δ16079
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173.287 (b) introductory text and (b)(1) revised..........Δ16079
173.288 Heading, (a) introductory text and (a)(2) revised..........Δ16079
173.289 (a)(2), (7), and (9) revised; (a)(2)(i) added..........Δ16079
173.291 (a) introductory text and (a) (1) and (2) revised..........Δ16079
173.295 (a)(3) revised..........Δ16079
173.298 (a)(4) revised..........Δ16079
173.300a Added..........Δ18414
173.300b Added..........Δ18415
173.300c Added..........Δ18415
173.301 (i) and introductory text of (j) revised..........Δ18415
173.306 Revised..........Δ16079
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173.307 Added..........Δ16081
173.308 Added..........Δ16081
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173.315 (a)(1) table amended.... Δ16081
173.325—173.398 (Subpart H) Heading revised...................... Δ16081
173.325 Revised.......................... Δ16081
173.326 Heading revised............ Δ16081
(a) amended.............................. Δ40683
173.327 Heading revised; (e) and (f) added................................ Δ16082
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173.328 Heading and (a) introductory text revised.............. Δ16082
173.330 (a) revised...................... Δ16082
173.331 Revised.......................... Δ16082
173.333 (a)(2) revised................ Δ16082
173.334 Heading and (a) revised.. Δ16082
173.335 Removed........................ Δ16082
173.336 (a)(3) revised................ Δ16082
173.338 (a)(3) revised................ Δ16083
173.343 Heading revised............ Δ16083
173.344 Heading, (b) introductory text, and (b)(1) revised.. Δ16083
(b)(1) amended.......................... Δ40683
173.345 Revised.......................... Δ16083
173.346 Heading, (a) introductory text, and (a) (3), (13), (19), (24), and (25) revised............. Δ16083
173.347 (a)(1) Note 1 removed.................................. Δ16083
173.348 (a)(2) revised................ Δ16083
173.349 (a)(2) revised................ Δ16083
173.350 (a) revised...................... Δ16083
173.351 Revised.......................... Δ16083
173.352 Heading, (a) introductory text, and (a)(2) revised.. Δ16084
173.353 Heading and introductory text of (a), (a)(1), (a)(2), (a)(6), and (c) revised............ Δ16084
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173.353a Added........................ Δ40683
173.357 Heading and introductory texts of (b) and (c), and (b)(4) revised; (b)(2) Note 1 removed.................................. Δ16084
173.358 Heading and (a) revised.. Δ16084
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173.359 Heading and (c) revised.. Δ16084

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173.361 (b) removed.................... Δ16084
173.363 Heading revised............ Δ16084
173.364 Revised.......................... Δ16084
(a)(3) amended.......................... Δ40684
173.365 Heading, (a) introductory text, and (a)(15) revised... Δ16085
173.367 (a)(2) through (a)(6) and (b)(2) revised.................. Δ16085
173.368 Revised.......................... Δ16085
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173.369 (a)(11) and (b) introductory text revised.................... Δ16085
173.370 Heading and (a), (b), and (d) introductory texts and (a)(8), (a)(12), and (b)(3) revised.. Δ16085
173.371 Revised.......................... Δ16085
173.373 Heading and (a)(4) revised.. Δ16086
173.374 Amended........................ Δ16086
173.375 (a)(1) Note removed..... Δ16086
173.376 (b) removed.................... Δ16086
173.377 Heading and introductory texts of (a), (b), and (g), and (f), (g)(1), (h) and (i) revised.. Δ16086
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173.379 Revised.......................... Δ16086
173.381 Heading and (b) revised; (c) redesignated as (d); new (c) and (e) added.................... Δ16086
173.382 (a) introductory text and (b) revised........................ Δ16086
173.384 Removed........................ Δ16086
173.391 Heading, (a) through (c) introductory texts, and (d) revised.. Δ40684
173.393 (p) added........................ Δ40684
173.399 Removed........................ Δ16086
173.400—173.417 Removed........ Δ16086
173.420—173.422 Removed........ Δ16086
173.425 Removed........................ Δ16086
173.426—173.432 (Subpart I) Heading revised...................... Δ16086
173.426 (a) and (b) revised......... Δ16087
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173.431 Removed.......... Δ16087
173.432 (a) and (e) revised.......... Δ16087
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173.500—173.510 (Subpart J) Added.......... Δ16087
173.501 Removed.......... Δ40684
173.605—173.655 (Subpart K) Added.......... Δ16087
173.610 Added.......... Δ40684
173.620 (a)(6) added.......... Δ40684
173.650 (a)(1) revised.......... Δ40684
173.800—173.860 (Subpart L) Added.......... Δ16088
173.861 Added.......... Δ37115
173.862 Added.......... Δ37115
173.910—173.1085 (Subpart M) Added.......... Δ16089
173.948 Removed.......... Δ40684
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173 Appendix D added.......... Δ16092
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174 Revised.......... Δ16092
Certain sections compliance date provision changed.......... Δ26015
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174.1 Amended.......... Δ40685
174.3 Amended.......... Δ40685
174.5 Amended.......... Δ40685
174.8 (a) and (b) amended.......... Δ40685
174.10 (c) amended.......... Δ40685
174.25 (a) introductory text, (a)(2) table, (c) and (d) amended; (a)(1) removed; (a)(3) redesignated as (a)(1) and amended; (a)(2) introductory text and (b)(1) through (6) revised.......... Δ40685
174.26 (a) amended.......... Δ40685
174.56 Removed.......... Δ40685
174.61 Heading, (a), and (b) amended.......... Δ40685
174.63 (a) amended.......... Δ40685
174.67 (a) amended.......... Δ40685
174.81 (a) table amended.......... Δ40685
174.83 (a) amended.......... Δ40685
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174.89 Heading and text amended.......... Δ40685
174.90 (a)(2) amended.......... Δ40685
174.91 Amended.......... Δ40685
174.92 Existing text designated as (a); (a)(2) amended.......... Δ40685
174.93 Revised.......... Δ40685
174.101 (h) and (i) amended.......... Δ40685
174.104 (b)(1) revised; (b)(5) and (f) amended; Note 2 added.......... Δ40685
174.110 Amended.......... Δ40685
174.114 Heading and (a) amended.......... Δ40685
174.201 (c) amended.......... Δ40685
174.204 (a) amended.......... Δ40685
174.290 (b)(2) and (3) amended.......... Δ40686
174.410 (d) amended.......... Δ40686
174.541—174.584 Effective date amended.......... Δ40691
174.541 Effective date postponed to 1-1-77.......... Δ57433
175.580 Heading and text amended.......... Δ40686
174.584 Effective date postponed to 1-1-77.......... Δ57433
174.680 Amended.......... Δ40686
174.700 (b), (c) table, and (e) amended.......... Δ40686
174.715 (a) revised.......... Δ40686
174.810 (b) amended; (c) added.......... Δ40686
174.812 (b) amended.......... Δ40686
175 Revised.......... Δ16106
Certain sections effective date provision changed.......... Δ26015
Authority citation revised; eff. 1-3-77.......... Δ38180
Authority citation revised.......... Δ40686
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175.10 (a)(2) and (a)(2)(vi) revised; (a)(4)(i) amended; (a)(9) and (10) added.......... Δ40686
175.30 (a)(2) amended; (b) revised.......... Δ40686
175.33 Revised.......... Δ40686
175.45 (a)(7) amended.......... Δ40686
175.75 Revised.......... Δ40686
175.85 (b) introductory text revised; (b)(3) amended.......... Δ40686
175.90 Amended.......... Δ40686
175.310 (c) (2) and (3) amended; (c)(4) added.......... Δ40686

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175.320 (a) table, (c) introductory text, and (c)(1) amended Δ40686
175.700 (d) added Δ40687
176 Revised Δ16110
Certain sections effective date provision changed Δ26015
Authority citation revised; eff. 1-3-77 .... Δ38180
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176.5 (a), (b)(6), (b)(7), and (e) amended; (b)(8) added Δ40687
176.11 (a) and (d) revised; (e) added Δ40687
176.15 (a) amended Δ40687
176.27 (a) and (b) amended Δ40687
176.30 (a) introductory text and (3) amended; (a)(6) and (7) redesignated as (a)(7) and (8); new (a)(6) added; (b) revised Δ40687
176.48 (c) amended Δ40687
176.50 Amended Δ40687
176.63 (a), (b), and (d) amended Δ40687
176.65 Added Δ40687
176.69 (a) and (c) amended Δ40687
176.76 (a) introductory text, (a)(9), (d), and (g)(5) amended; (g)(3) revised Δ40687
176.78 (a) revised; (d) and (h)(6) amended Δ40687
176.83 (a) tables I and II revised; (c)(4)(i) and (d)(3)(iv)(C) amended Δ40688
176.88 Amended Δ40690
176.105 (c) amended Δ40690
176.114 Correctly designated as 176.144 .... Δ40690
176.135 (d) amended Δ40690
176.138 (b)(3) amended Δ40690
176.144 Correctly designated from 176.114 .... Δ40690
176.205 (a) amended; (b)(1) through (8) redesignated as (b)(2) through (9); new (b)(1) added Δ40690
176.305 (b)(1) and (2)(i) amended Δ40690
176.315 (e) added Δ40690
176.328 Redesignated as 176.905; (c) amended Δ40690

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176.410 (a)(2) through (4) amended; (a)(6) and (7) revised Δ40691
176.415 (a)(1) and (b)(5) revised; (a), (b)(4), (c) introductory text, and (c)(4) amended Δ40691
176.600 Existing text designated (a); (b) added Δ40691
176.800 (b) amended Δ40691
176.805 (a) revised; (b) and (c) redesignated as (a)(1) and (2) Δ40691
176.817 (a), (b), and (d) revised; (c)(i) and (ii) redesignated as (c)(1) and (2) Δ40691
176.900 (i) amended Δ40691
176.905 Redesignated from 176.328; (c) amended Δ40690
177 Heading revised Δ16130
Nomenclature changes Δ16130, 16131
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Authority citation revised; eff. 1-3-77 .... Δ38180
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177.803 Revised Δ16130
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177.811 (a) revised; (b) added Δ16130
(b) amended Δ40691
177.814 (a) and (d) revised Δ17736
177.815 Revised Δ16130
177.816 Removed Δ16130
177.817 Revised Δ16130
(a), (b), and (d) revised; (c)(i) and (ii) redesignated as (c)(1) and (2) 40691
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177.823 Revised Δ16130
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177.834 (1) revised 46106
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177.841 (e) revised Δ16130
177.854 (g) eff. date of revision extended; removed 45824
(g) removed Δ27968

NOTE: Symbol (Δ) refers to 1976 page numbers.

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171.7 (d)(1) amended 52300
 (d)(5)(iv) and (v) added *34284
 (d)(5)(vi) and (vii) added *36262
171.8 Amended 57020
171.15 (a)(4) revised 57020
172 Placarding effective date extended to 1-1-78 *28888
 Incorporation by reference added *34288
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172.100 (c) and (h) introductory texts amended; (c)(7) revised 57020
172.101 Revised 57021
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172.201 (a)(1) and (a)(1)(ii) revised 57067
172.203 (e) and (g)(1) revised; (g)(2) removed; (g)(3) redesignated as (g)(2) 57067
172.204 (a) introductory text revised 57067
 (c)(4) amended *22367
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172.304 Heading revised 57067
172.306 Heading and (a)(1) revised 57067
172.312 (a) introductory text revised 57067
172.328 Revised 57067
172.330 (a) introductory text, (c)(1) and (2), and (d) revised; (e) added 57067
172.400 (b)(6) revised 57067
172.406 (a) amended 57067
172.407 (a), (d), and (g)(3) revised *34284
172.504 (a) and (c)(1) revised; (a) tables amended 57067
172.508 (a) revised 57068
172.512 (a) revised and table removed; (b) amended 57068
172.514 (a) amended 57068
172.519 (e) revised *34285

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172 Appendix B amended 57068
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173 Authority citation revised 55878
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173.6 (b)(3) revised 57068
173.8 (b) amended 57068
173.22 (a) revised *2689
173.29 Revised 57068
173.31 (d) table samended *28133
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173.33 (c) removed; (d) through (l) redesignated as (c) through (k) 57068
173.63 (e)(2) revised *28133
173.64 (a)(5) revised 55876
173.66 (c) revised 50263
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173.68 (a)(1) revised 50263
173.88 (e)(2)(ii) revised *11239
173.92 (b) revised *11239
173.100 (p) revised 50263
173.107 (d)(1) added *42207
173.116 (c) removed 57069
173.119 (m)(5) revised 50263
 (a)(26) added 55876
 (a) introductory text and (d) revised; (m)(10), (11), (12), (13), and (15) amended 57069
 (a)(27) added *42207
173.124 (a)(3) revised 55876
 (a)(5) amended 57069
173.132 (a)(2) revised *11239
173.139 (a)(4) revised *28133
173.141 (a)(7) revised 50263
173.145 (a)(7) revised 50263
173.148 (b) added *11239
173.154 (a)(16) added *36262
173.163 (a)(8) revised *11239
 (a)(7) revised *28133
173.182 (c)(3) and (4) added 55877
173.205 (a)(2) added *11239
173.208 (a)(2) added 50263
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173.214 (c)(5) added *11239
173.217 (a)(5) revised; (a)(6) amended 57069
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173.219 (a)(1) revised *11239
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173.245b (a)(8) revised....*28133
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173.247a (a)(3) added....50263
173.249 (b) introductory text amended....57069
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173.262 (a)(12) added....50263
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173.265 (b)(3) revised....*11240
173.266 (b)(9) added....50264
173.268 (c)(2) revised....*28133
173.271 (a)(11) revised....50264
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173.272 (g) and (i)(6) revised.... 50264
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173.273 (a)(4) revised....*28134
173.275 (a)(5) added....*42208
173.276 (a) introductory text revised....57069
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173.294 Heading and (a) introductory text revised.... 57069
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173.314 (c) Note 12 and (e) revised....55877
(c) table amended....*28134
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173.315 (a)(1) Note 11 revised.... 55878
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173.336 (a)(3) revised....50264
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173.358 (a)(5) revised; (a)(13) added....55878
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173.359 (a)(6) and (b)(5) revised; (a)(15) and (b)(11) added....55878
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173.373 (a)(5) added....50264
173.377 (a)(1) and (2) revised; (b)(6) added....*11241
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173.635 (a)(5) added	55378
173.800 Heading and (a) introductory text amended	57070
173.1025 Revised	57070
173.1200 (a) introductory text, (a)(2)(iii) and (8)(ii) revised; Appendix A amended	57070
174 Heading corrected	*2071
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174.10 (a) amended; (c) revised	57071
174.12 (a) amended	57071
174.24 (b) removed; (c) redesignated as (b) and revised	57071
174.25 (a)(2)(ii), (b) introductory text, (b)(4), and (c) revised; (b)(6) removed	57071
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175.30 (b) amended	57072
175.320 (c)(1) and (2) revised	54942
175.700 (d) revised	*22367
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176 Placarding effective date extended to 1-1-78	*28888
176.11 (a) amended	57072
176.30 (a) revised	57072
176.45 (a) amended	57072
176.48 (a) and (c) amended	57072
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177 Placarding effective date extended to 1-1-78	*28888
177.838 (a) revised	*11241

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101 Nomenclature changes	43306
101—105 (Subchapter A) Heading revised	†43306
101.1 (b) amended	†43306
102 Redesignated as Part 106; nomenclature changes and authority citation revised	†43306
106—109 (Subchapter B) Heading revised	†43306
106 Redesignated from Part 102; nomenclature change and authority citation revised	†43306
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107 Heading and authority revised; Nomenclature changes	†43307
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107.101—107.125 (Subpart B) Appendixes A and B redesignated from Part 107; Appendix B amended	†43308
107.101 Amended	†43308
107.103 (b)(1) amended	†43308
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(d)(19) added	†31139
171.8 Amended	†36446
171.12 (e) added	†10918
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172.100 (g)(3) revised	57964
172.101 Table amended	57965
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172.203 (d)(1)(ix) added	†10918
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173.28 (m) introductory text revised	†31140
173.31 (a)(5) revised	†30061
173.34 (e)(13)(i) and (iii) revised; (e)(13)(v) added	63644
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173.65 (a)(3) added; (d) revised	57965
(d) revised	†8521
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173.89 Revised	57965
173.93 (a)(1) added; (a)(12) and (e)(4) removed	†31140
173.107 (d)(2) added	57965
173.110 Heading revised; (c) added	†39791
173.113 (a)(1) revised	58937
173.119 (m)(2) and (8) revised	57966
(a)(28) added	58937
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173.139 (a)(6) revised	58937
173.148 (a)(5) revised; (a)(6) added	†17944
173.154 (a)(3) and (4) added	57966
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173.157 (b)(3) revised	57966
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173.182 (c)(4) revised	57966
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173.204 (a)(4) revised	58937
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173.221 (a)(9) revised	57966
173.223 (a)(5) revised	58938
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173.241 (a)(3) revised	†8521
173.242 (a) and (b) revised	†31141
173.245 (a)(27) revised	†17944
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173.245a (a) table amended	†31141
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173.245b (a)(5) revised	†39791
173.247 Heading and (a)(17) revised; (a)(18) and (19) added	†31141
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173.247a (a)(1) and (3) revised	†31141
173.249 (a)(7) revised; (a)(13) added	58938
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173.346 (a)(12) revised.................57967
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173.359 (a)(17) and (b)(12) added.. †31142
173.364 (a)(1) revised.................†31142
173.365 (a)(14) revised..................58938
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175.10 (a)(11) and (12) added.... †39792
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176.230 Added................................†8522
176.415 (c)(5) added...................... †8522
176.905 (k) revised......................†39792
177.804 Added................................ †4859
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171.5 (a) amended; eff. date corrected....48643, 51020
171.7 (a) amended; (b) revised; eff. date corrected....48643, 51020
(d)(3)(ii) amended....Δ3708
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(d)(5)(viii) added....Δ14195
(d)(17) revised....Δ30687
(d)(1) revised....Δ34960
(c)(16) and (d)(16)(i) revised....Δ49456
171.8 Amended....48643
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171.14 (a) amended; eff. date corrected....48643, 51020
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171.16 (b) revised; eff. date corrected....48643, 51020
171.18 Revised....Δ55577
171.19 Added....Δ18027
172.100 Effective date corrected....51020
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172.101 Table amended...56667, 57892, 57901
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172.204 (c)(4) revised....Δ25238
172.407 (d)(1) and (3) amended; eff. date corrected....48643, 51020
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172.411 Heading revised; (c) and (d) added....57902
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173.2 (b)(2) revised....Δ31182
173.7 (a) introductory text amended; (c) added....Δ49458
173.21 (d) revised....Δ55577
173.22a (b) amended....48643
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173.26 Heading and (a) revised...56044
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173.69 (a) Note 1 amended; eff. date corrected....48643, 51020
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173.302 (a)(2) amended	49903
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173.334 (a)(1) amended	Δ43066
173.336 (a)(2) revised	62458
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173.337 (a)(1) and (2) revised; (a)(3) and (4) removed	62458
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